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**ROAD SAFETY**

**YOUNG DRIVER RISKS AND EFFECTIVE COUNTER-MEASURES**

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## YOUNG DRIVER RISKS AND EFFECTIVE COUNTER-MEASURES

### JTRC RESEARCH FINDINGS

This document outlines the key findings of the Joint OECD/ECMT Transport Research Centre's (JTRC) current research project on *Young Driver Risks and Effective Countermeasures*.

#### KEY MESSAGES

The over-representation of young drivers -- particularly young males -- in crashes and road fatalities is a serious public health problem that exacts an unacceptable toll in human, social and economic terms. Young drivers account for about 27 % of driver fatalities across OECD countries, although people in the same age group represent only about 10 % of the population. Furthermore, between 20 % and 30 % of total traffic fatalities result from crashes involving a young driver. Young male drivers' crash fatality rates can be as much as three times that of young female drivers, and remain much higher even when adjusted to factor in their higher rates of exposure. Taking action to reduce young driver risk will be essential in achieving the road safety targets set by ECMT Ministers, Associate countries and the European Union. Key findings of the current JTRC research project indicate that:

- The high levels of young driver risk result principally from factors of inexperience, age, and gender, and the period immediately following licensing for solo driving is particularly dangerous. Combating the young driver problem requires a combination of countermeasures, and close co-ordination between different levels and areas of government, stakeholders, and young drivers themselves. Countermeasures need to be adapted to the customs, circumstances and legal traditions of each country.
- The greatest reductions in young driver risk will result from higher overall road safety levels, which require effective legislation and enforcement, particularly dealing with speed, alcohol, drugs and seatbelts. At the same time, non-road safety measures, such as the availability of public transport at reasonable cost, can also affect young driver risk exposure.
- High levels of accompanied practice before licensing for solo driving, involving a variety of driving circumstances, will result in lower levels of fatalities. While at least 50 hours of pre-licensing practice are recommendable, experience in one country showed that increasing this to 120 hours reduced crashes in the two years following licensing by about 40 %.
- Exposure to risk following licensing for solo driving can be reduced by protective restrictions that are progressively lifted as the novice gains experience, as seen in Graduated Driving Licensing systems. Restrictions known to be effective include maximum BAC levels for young drivers of no more than 0 or 0.2 g/l, and initially restricting driving with young passengers and at night. Also, higher demerit points can be assigned for infractions in a probationary period following licensing.

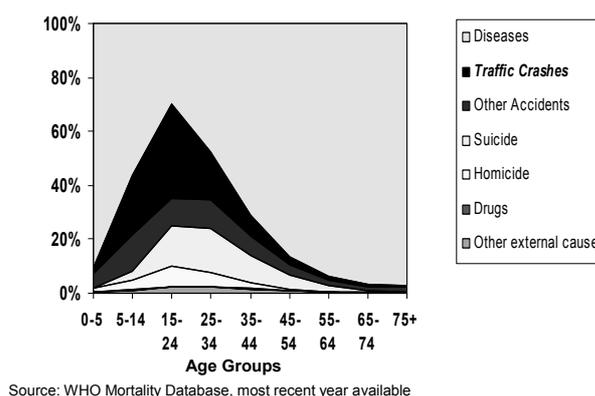
- Especially before the age of 18, any lowering of the age for solo driving will result in increased overall fatalities, and should be resisted. Licensing conditions for motorized two-wheeled vehicles should be similarly stringent to avoid migration toward less safe forms of transport.
- The fundamental goals of education, training and licensing should be to create drivers who are safe, as well as technically competent. Novice drivers need greater self-assessment skills and understanding of the factors behind risk. Persuasive communications should accompany other countermeasures, with a view to changing attitudes and creating greater understanding of risk, noting that attitudes regarding safety are formed years before the driving age, and are highly influenced by role models' behaviour.
- Important new reductions in young driver risk could result from technological applications, such as Intelligent Speed Adaptation, Adaptive Cruise Control, Electronic Stability Control, black boxes, alco-locks and smart cards, and more research should be conducted in this area, particularly focusing on the impact on young drivers.

## SUMMARY OF RESEARCH FINDINGS

Globally, young drivers are greatly over-represented in crash and fatality statistics.<sup>1</sup> They pose a greater risk than other drivers to themselves, their passengers and other road users. The costs imposed on individuals, families and societies are unacceptable, and demand action.

ECMT Ministers have established the target of a 50 % reduction in traffic-related deaths over the period 2000-2012. Similar commitments have been made within the European Union and by many governments. A 2004 United Nations General Assembly Resolution recognised the high cost of traffic crashes on global human health, and resulted in the UN global Road Safety Collaboration initiative led by the World Health Organisation. Addressing the issue of young driver risk will be essential to achieve the goals of these initiatives.

Figure 1. Causes of Death by Age Group, OECD Countries

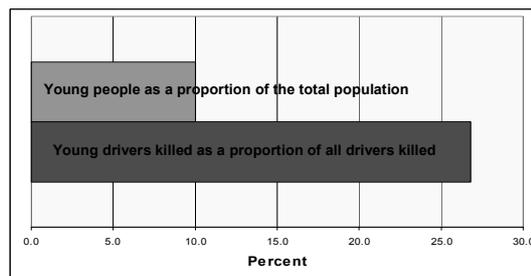


1. This note focuses on passenger vehicle drivers below the age of 25, keeping in mind that the licensing age varies from country to country. However, it should be noted that many of the proposed countermeasures would be relevant for all novice drivers.

### What is the scope and nature of the problem?

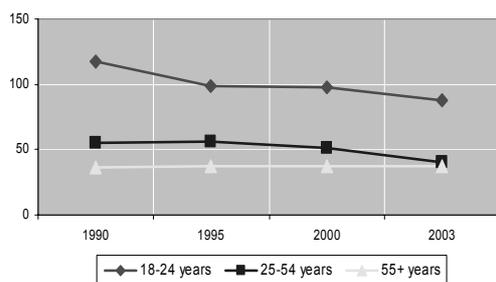
Traffic crashes are the single greatest cause of death for 15-24 year-olds in OECD countries, killing approximately 25 000 per year. Figure 1 shows how traffic deaths rise sharply in this age group. It is estimated that over 9 000 young drivers of passenger vehicles were killed in OECD countries in 2004, including over 750 in Germany, 645 in France, over 300 in Japan, over 300 in Spain, and almost 4 000 in the US.<sup>2</sup> As Figure 2 shows, this means that young drivers represent about 27 % of all drivers killed in OECD countries, although people in the same age groups only account for about 10 % of the population. Furthermore, for each young driver killed, a likely 1.3 or more passengers or other road users also die, based on findings from the US and the Netherlands, and national data from various countries indicate that crashes involving a young driver account for between 20 % and 30 % of total road traffic fatalities. While data are not generally available for countries that are not part of the OECD, it must be assumed that their situations regarding young drivers are similar, including in some ECMT countries where the overall road safety situations are worse than those of most OECD members. World Health Organization data shows that, globally in 2002, road traffic injuries were the second largest single cause of death for people aged 15-29, and the largest cause of death for men in the same age group.

**Figure 2. Proportion of Youth in Traffic Fatalities and Population OECD Countries, 2004**



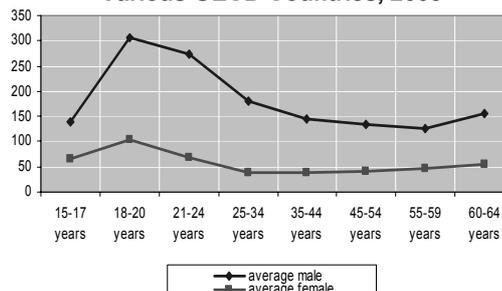
Source: IRTAD. Refers to persons under 24 and old enough to drive solo. Data from earlier years used when 2004 not available. Data lacking from some OECD countries

**Figure 3. Driver Fatalities per Million per Age Group Selected OECD Countries**



Source: IRTAD

**Figure 4. Road Traffic Fatalities Per Million Population, by Gender Various OECD Countries, 2003**



Source: IRTAD

As Figure 3 reveals, across the OECD, death rates for 18-24 year old drivers are typically about double those of older drivers. While young novice driver death rates have decreased in recent decades, they have generally done so in proportion to overall

2. Based on figures from International Road Transport Accident Database (IRTAD).

improvements; in other words, invariably, they remain considerably higher than death rates for older drivers, indicating that the problem is not being resolved.

Death rates for young male drivers are consistently much higher than those of their female counterparts, often by a factor of three, as seen in Figure 4. Large differences remain after adjusting for exposure to take into consideration the fact that men drive more than women.

Young people are over-represented in single-car and loss-of-control crashes, and crashes where the driver is turning across oncoming traffic. Young novice drivers have disproportionately high numbers of crashes when driving at night and/or on weekends, when carrying passengers, and as a result of speeding. Alcohol and driving without seatbelts remain key factors in young driver crashes and resulting deaths and injuries. Drug driving is on the rise, particularly among young men; the most commonly detected drug is cannabis, which becomes especially dangerous when mixed with alcohol, and for habitual users.

### **What are the key factors behind the problem?**

Why do young novice drivers have such high crash rates? The response can be summarized under three general headings: experience, age and gender.

Where experience-related factors are concerned, learning to drive takes time and needs extended practice in order to reach a sufficient competence level -- this is true for everyone, not just the young. With time, the actions of driving -- changing gears, looking in the rear-view mirror, steering, etc. -- become automated. However, for the novice driver, these actions require consideration, increasing overall mental workload and serving as a distraction. Thus, novice drivers have more limited attention and dual task performance abilities. At the same time, because serious crashes are relatively rare events, new drivers are not provided with the sort of "negative" feedback that might induce them to drive more carefully, while they are also under the influence of the motivation to arrive at a destination as quickly as possible, as well as other factors, such as peer pressure or a desire to "show off".

Data clearly show that young driver crash involvement decreases as the licensing age for solo driving increases, indicating that age plays a role in causing crashes. Indeed, physical and emotional immaturity, as well as the lifestyles associated with youth can increase crash risk and severity. Young people are typically in the throes of a period of rapid maturation, whereby they test boundaries and assert independence. They are in a period in life that is often intensely social, including heavy socialising at night and on weekends, in groups, and sometimes involving alcohol and/or drugs.

Young men drive more than young women. Furthermore, research has revealed that they are more inclined toward risk-taking, sensation-seeking, speeding and anti-social behaviour than their female counterparts. They are also more likely to over-estimate their driving abilities and more susceptible to the influence of their friends.

The reasons why age, gender and experience combine so destructively in young people on the road, and why some young people are more risk prone than others, are highly complex. They involve a myriad of interacting factors, which can be broadly categorised in terms of physiological and emotional development, personality, social norms, the role of youth in society, individuals' socio-economic circumstances, impairments to capabilities, the driving task itself, and the type of driving that young novice drivers might engage in. Certain personality types are particularly subject to high crash risk. Social norms, including peer pressure and the emphasis placed on rebellion in youth culture, affect driving style, as do the examples provided by role models. Alcohol, drugs, fatigue, emotions and in-vehicle distractions, such as mobile telephones, all impair a driver's abilities. Young people, especially males, are particularly inclined to overestimate their driving abilities. Based on economic considerations, young people may also drive older vehicles with fewer safety features. Recent research also indicated that the parts of the brain responsible for inhibiting impulses and weighing the consequences of decisions may be under development until after the teenage years, possibly impacting on driving behaviour. Furthermore, different testosterone levels partially explain the divergence in behaviour between young men and women. In short, young drivers' high risk levels are a product of both who they are and the environment in which they exist.

All of this leaves policy-makers with a complex problem. While young novice drivers must gain experience to be safer, the process of gaining that experience exposes them, and others, to high levels of risk. Also, the mobility associated with driving provides people with access to many social, economic and education opportunities. Individual young drivers are much more likely than others to have crashes, and many do, but only a small minority of these results in death or serious injury. With this in mind, how do we tackle the problem of young novice driver risk without limiting young people's access to experience and overall mobility, and without appearing to unfairly penalise youth or a sub-group of youth, such as young men?

### **What are our options for action?**

Reducing the number of young novice driver crashes and fatalities will require a focussed and co-ordinated approach, involving education, training, licensing, enforcement, communication and the selective use of technology, in combination with other road safety measures. The success of this approach will require public and political acceptance of the gravity of the problem and need to act, and the proactive participation of regulators and lawmakers; transport, health, safety and education administrations; the police; parents; and young drivers themselves. The goal of these efforts should be to create a situation in which overall road safety continually improves while the differences in risk levels between young and older drivers are greatly reduced, especially with regard to young male drivers.

A key first step in reducing young novice driver risk is to work to ensure the highest possible overall standards of road safety. However, it is also important to implement countermeasures that will reduce the wide gap between young drivers' risk levels and those of older, more experienced drivers. Given the nature of the problem, actions need

to be concentrated on breaking the historically developed dangerous link between, on the one hand, immaturity and inexperience and, on the other, unlimited access to unsupervised solo driving in the challenging environment that is traffic. Breaking this link inevitably involves measures that either limit the available choices, or alter the attractiveness of these choices.

The licensing process itself presents the most important opportunities. Countries employ different licensing systems, often partially based on the age at which solo driving first begins. However, common objectives for risk reduction are seen throughout the world and there are increasing similarities between different systems.

For example, it is particularly important that substantial experience be attained in lower-risk conditions before unrestricted solo driving. High levels of accompanied practice before licensing for solo driving, conducted in a methodical manner that involves a variety of driving circumstances, will result in lower levels of fatalities. Thus, in any system, while at least 50 hours of pre-licensing practice are to be recommended, experience in one country showed that increasing this to 120 hours reduced crashes in the two years following licensing by about 40%<sup>3</sup>.

Risk can be greatly reduced in the period immediately following licensing, particularly in the first year, by way of protective restrictions that are progressively lifted over time, as seen in Graduated Licensing systems. For example, low minimal BAC levels for young drivers, such as 0 or 0.2 g/l, would be highly desirable, and important risk reductions have been shown to result from temporarily restricting driving with young passengers or at night. These countermeasures, in particular, could do much to address the circumstances that contribute to the seriousness of many young novice driver crashes, such as speeding, night-time driving, drink-driving, single-car and loss-of-control crashes, and non-use of seatbelts. Furthermore, they could be supported by higher demerit points assigned for infractions in a probationary period following licensing.

Particularly below 18 years-old, any lowering of the age for solo driving will result in increased overall fatalities, and should be resisted for safety reasons. Conditions for driving motorized two-wheeled vehicles should be similarly stringent to prevent migration to less safe forms of transport.

Training should focus on creating drivers who are safe, and not just technically competent, meaning that there should be increased focus on self-assessment and understanding of the factors that increase risk, including the context in which driving is

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3. In Sweden, in 1993, the minimum age for accompanied learning was lowered from 17½ to 16, while the minimum solo driving age remained 18. Approximately 45-50 % of 16 year-olds obtained their learner's license during the first 2½ years of the new programme. This resulted in an increase to a mean of 117.6 hours of accompanied learning before licensing, compared to a mean of 47.6 hours before the change, although the hours of accompanied learning among those who did not get their learner's permits at 16 remained at a mean of 41.4. In the follow-up period of two years, the crash risk of young novice drivers who had begun accompanied learning at 16 was reduced by 40 %, adjusted to account for confounding factors, and the overall young novice driver crash risk was reduced by 15 %.

undertaken -- the primary goal of training should not be to help the novice driver pass the test. Formal training is not a replacement for accompanied practice under protective conditions. Education, stated training objectives and the test should reinforce one another.

Clearly, many of the countermeasures inherent to the licensing process will not be effective without sufficient enforcement. However, it is difficult to specifically target young novice drivers, and robust overall enforcement of laws regarding speed, alcohol, drugs and seatbelts will make important contributions to reducing young driver-related fatalities. New technologies, such as black boxes, smart keys and alco-locks, offer opportunities to ensure compliance with the conditions attached to licensing. Furthermore, intelligent speed adaptation, adaptive cruise control and electronic stability control could reduce both voluntary and involuntary dangerous driving.

Countermeasures, especially enforcement, should be accompanied by communications and education efforts aimed at altering the fundamental attitudes that exacerbate risk, targeting, in particular, males. It should also be noted that many safety-related attitudes are established well before the driving age, and are highly susceptible to the influence of role models.

Non-road safety measures -- such as the availability and cost of public transport, the cost of operating a vehicle, limitations on parking at schools, and the location of services of interest to young people -- can also have an impact on risk. All public policy decisions should take into account their potential road safety impact.

### **How do we manage change?**

Given the severity of the problem, it is imperative that governments take action to reduce young novice driver risk, especially as measures to improve the safety of young and newly qualified drivers can be readily identified. However, there is often resistance to such change; the public and stakeholders may be reluctant to accept new measures, particularly if they impose higher costs or make it more difficult to obtain a licence. Overcoming such barriers to the acceptance of effective measures can be facilitated by carefully managing the process of change.

To begin with, proposed countermeasures must be realistic, and based on thorough research of the problem and the costs and benefits of proposed solutions in each jurisdiction, which should be clearly communicated. Decision-makers need to show courage and leadership in publicly acknowledging the problem and the need to act, and a senior-level "champion" for the issue is often helpful. Different agencies within government and levels of government should co-ordinate closely, sharing resources and ideas. Stakeholders should be consulted, including young drivers, parents, employers, driving instructors, testing agencies, police, the health and education sectors, the insurance industry, and road users in general. In some instances, stakeholder groups will play a key role in educating decision-makers and the public regarding the nature of the problem, and in proposing solutions. Finally, countermeasures should be phased in, showing concrete results at each step. Careful consideration needs to be given to ensuring that they do not impact unequally on more disadvantaged sectors of society.

They should also be subject to analysis, and adjusted where they are not showing desired or adequate results. An effective step-wise implementation of countermeasures could include:

1. Proactively promoting the highest possible overall levels of road safety, and ensure rigorous enforcement of road safety law, particularly with regards to speeding, alcohol, drugs and seatbelt use;
2. Introducing high levels of pre-licensing accompanied practice, and protective measures during initial solo driving, including minimal BAC levels;
3. Improving driver training and testing, including more focus on self-awareness and understanding the circumstances that lead to safer driving; and
4. Understanding the benefits of technological solutions for monitoring and enforcement and for assisting the novice driver with the driving task, and selectively implementing these where they prove to be effective.