

Elderly driver safety in Switzerland – current reality and future perspectives

U. Ewert^a, A. Uhr^a

^a*bfu – Swiss Council for Accident Prevention, Bern, Switzerland*

Abstract

In Switzerland the number of elderly people as well as their driving licence possession rate and their kilometres driven are increasing. Elderly drivers' motor vehicle crashes are decreasing in absolute number but increasing in percentage. Since 1977 a biannual medical screening of licence owners aged 70 and older is mandatory. The system's effectiveness and efficiency were not evaluated. Studies on medical screening come to the conclusion that screening does not have positive effects on road safety and might have negative effects due to changes to less safe modes of transport. Ways to improve the effectiveness of the Swiss screening system are being discussed. Self-assessment instruments could complement older driver programmes. Driver assistance systems might help compensate elderly driver's weaknesses but recommendations should be based on proven effectiveness. Finally sustainable and safe mobility for the elderly unfit to drive will be considered to minimize the negative social and psychological effects of a loss of driving licence.

Keywords: older drivers, screening, treatment, self-assessment, policy

Sécurité des conducteurs âgés en Suisse: situation actuelle et perspectives

U. Ewert^a, A. Uhr^a

^a*bpa – Bureau de prévention des accidents, Berne, Suisse*

Résumé

En Suisse, le nombre d'ânés est en hausse, tout comme leur taux de possession du permis de conduire et leurs kilomètres parcourus au volant. Leurs accidents à bord de véhicules motorisés sont en recul en valeur absolue, mais en augmentation en pourcentage. Depuis 1977, tout titulaire d'un permis doit, dès l'âge de 70 ans, se soumettre à un contrôle médical bisannuel. L'efficacité et l'efficience de ce système n'ont pas été analysées, mais des études portant sur pareils dépistages ont montré qu'ils n'ont guère d'effets positifs sur la sécurité routière, voire qu'ils lui sont préjudiciables si les ânés se tournent vers des moyens de transport moins sûrs. Des solutions visant à améliorer l'efficacité du système sont discutées: instruments d'autoévaluation, systèmes d'assistance à la conduite pour compenser les faiblesses des ânés (les recommandations dans ce sens devront se fonder sur l'efficacité avérée de ces dispositifs); enfin, mise en place d'une mobilité sûre et durable pour les ânés inaptes à la conduite afin de limiter les préjudices psychologiques et sociaux liés à la perte du permis.

Mots-clés: conducteurs âgés, dépistage, traitement médical, autoévaluation, stratégie

Introduction

In Switzerland, as in the other European countries, the number of elderly is and will be increasing. The Federal office of statistics predicts, that the number of people aged 65 and older will increase from 1.5 million in 2014 to 2.3 million in 2035, an increase of more than 50 %. At the same time, the absolute number of people under the age of 20 and those aged 20 to 64 will remain fairly stable. The elderly's percentage of the total population will consequently increase from 18 to 26%.

Driver licence possession rates of the elderly will also increase, especially among women. Up until the age of 70 about 95% of the men have a driver's licence. Women in general have lower rates: slightly less than 90% in the age group younger than 55 years, decreasing to 75% by age 69. For both sexes the rates are dropping markedly beginning at age 70, when the mandatory medical check begins.

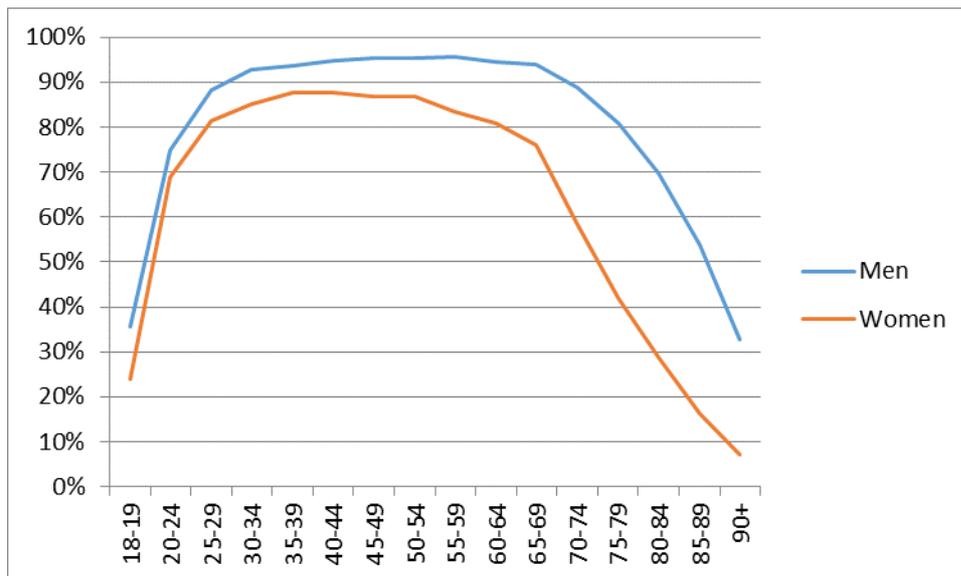


Fig. 1. Percent license possession by age (according to Bundesamt für Statistik, 2012a)

The distances driven by older drivers are increasing. From 2000 to 2010 the average daily distance driven of people aged 65 to 79 has increased by more than 2 kilometres or 25%. The increase of those aged 80 and older is somewhat lower in absolute distance (about 1.5 kilometres) but very marked in percentage (71%). But still, the elderly's distances driven are only about half of the middle-aged drivers distances for those under age 80 and about one fifth for those 80 and older (Bundesamt für Statistik, 2012b).

The expectation was that these three effects – increasing number of elderly, increasing licence possession rates and increasing distances driven – might lead to an increase in the number of accidents of the elderly drivers and a possible risk for themselves and for others. Fortunately this is not the case. Since the year 2000 the number of people killed in crashes of car drivers aged 65 and older decreased by 31%, those that were seriously injured by 8.5%. What is increasing though, is the relative percentage of motor vehicle crashes of the elderly. The number of fatalities in crashes with car drivers aged 65 and older has increased from about 13% to 18%, the number of severely injured from 10% to 14%. About half of the fatally injured and a quarter of the severely injured are the older drivers. These So, even if the total number of cases is decreasing, the relative importance of the crashes of elderly car drivers is increasing.

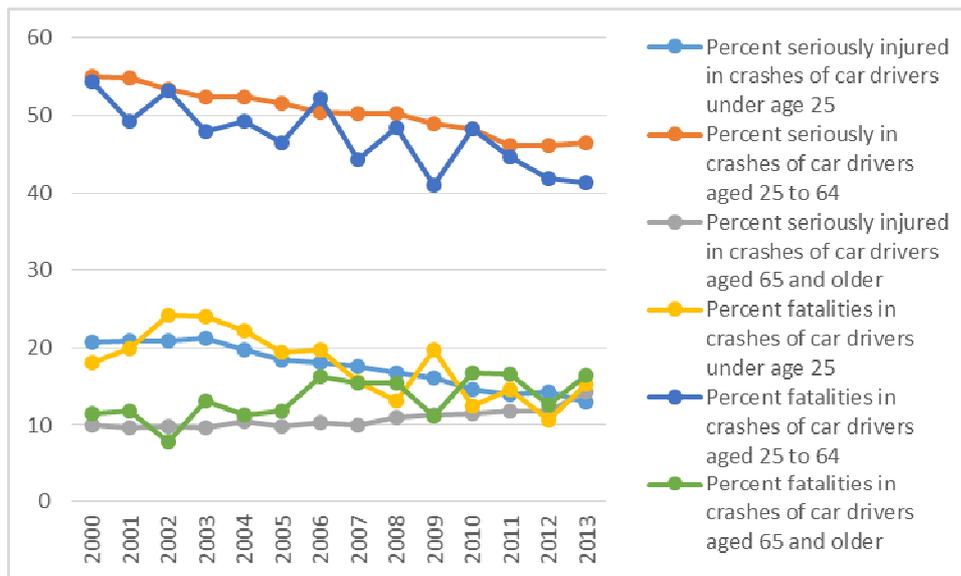


Fig. 2. Percent of all fatalities and severe injuries by age of car driver

Current reality

In Switzerland for elderly licence owners a medical check is mandatory every two years beginning at age 70. The licence owner is sent a reminder by the road traffic office including a form to be filled out by a physician. In most cantons (the states) the driver can choose to go to his family doctor to get the examination done. The medical requirements are relatively roughly defined (except for vision). If the requirements are not fulfilled and cannot be treated or compensated, the driver's licence has to be returned to the road traffic office.

Screenings are supposed to do more good than harm at reasonable costs (Raffle & Muir Gray, 2007). The question is, whether the medical screenings reduce motor vehicle fatality of the elderly and their crash opponents without negative side effects. Several studies have come to the conclusion that screenings do not provide safety gains and might even have negative side effects like switching to a less safe mode of transport (for example Hakamies-Blomqvist et al., 1996; Mitchell, 2008; Siren & Meng, 2012).

According to the EU-Project ConSol the following European countries have an age-based medical screening: Portugal, Ireland, Luxemburg, Netherlands, Denmark, Italy, Czech Republic, Slovakia, Finland, Slovenia and Greece. France, Belgium, Germany, Austria, Poland and Bulgaria do not have such a system.

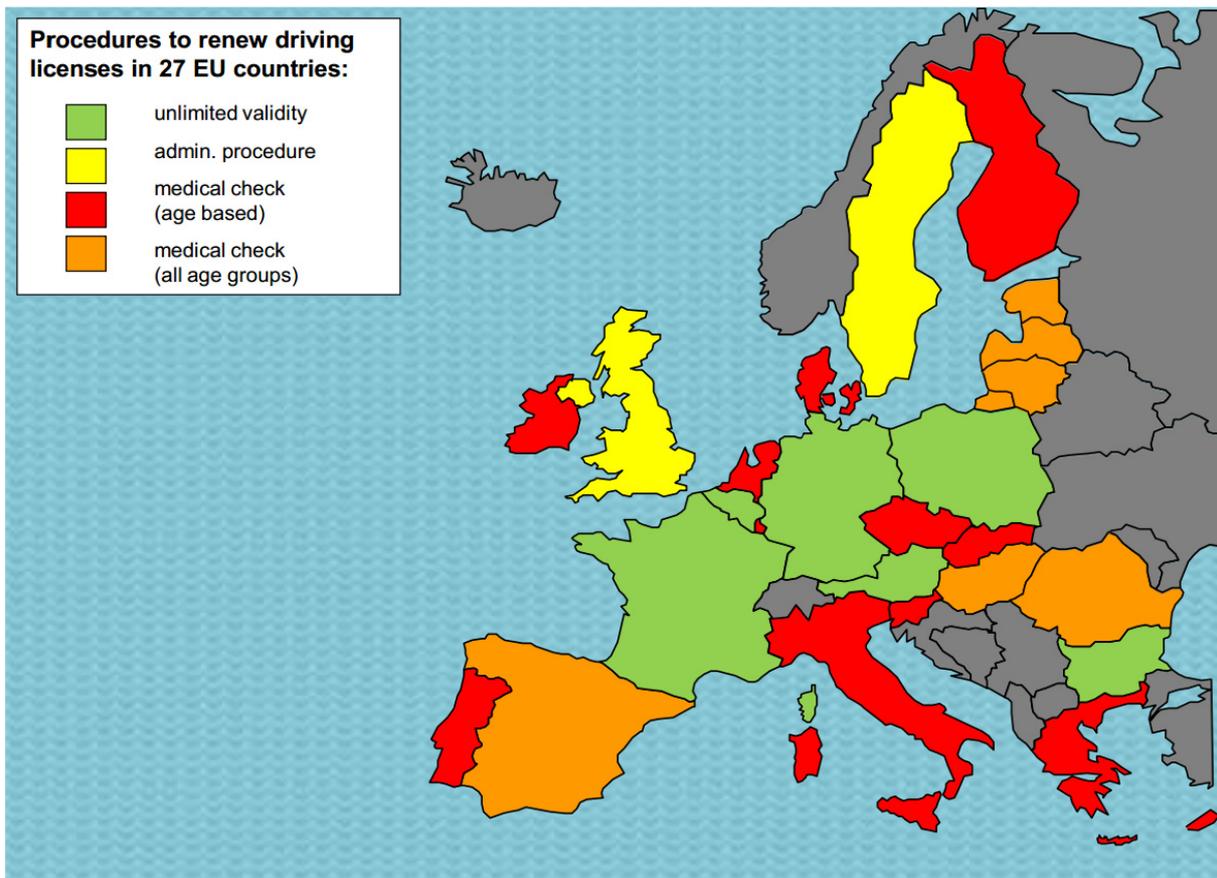


Fig. 3. Driver licensing procedures in Europe (Siren, et al., 2013)

A simple comparison of the fatality rates per population of the countries with and without medical screening with IRTAD data gives some indication that screening goes along with higher fatalities for car occupants as well as for pedestrians.

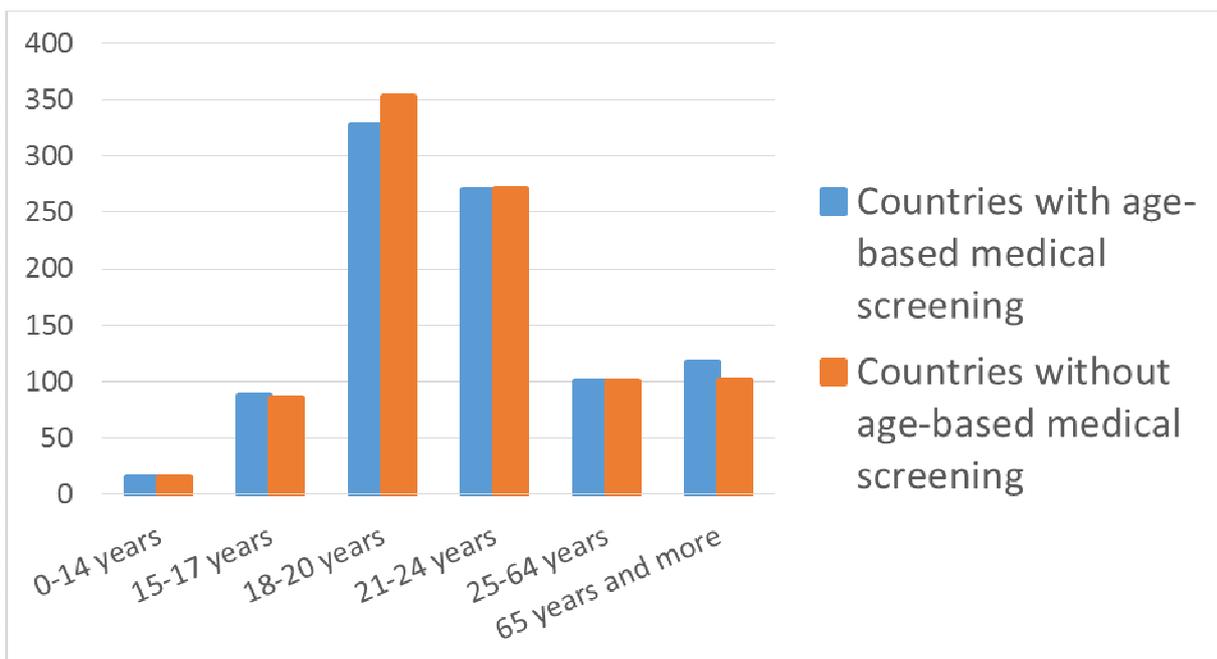


Fig. 4. Fatality rate of car occupants per million inhabitants in countries with and without medical screening (indexed to age group 25-64)

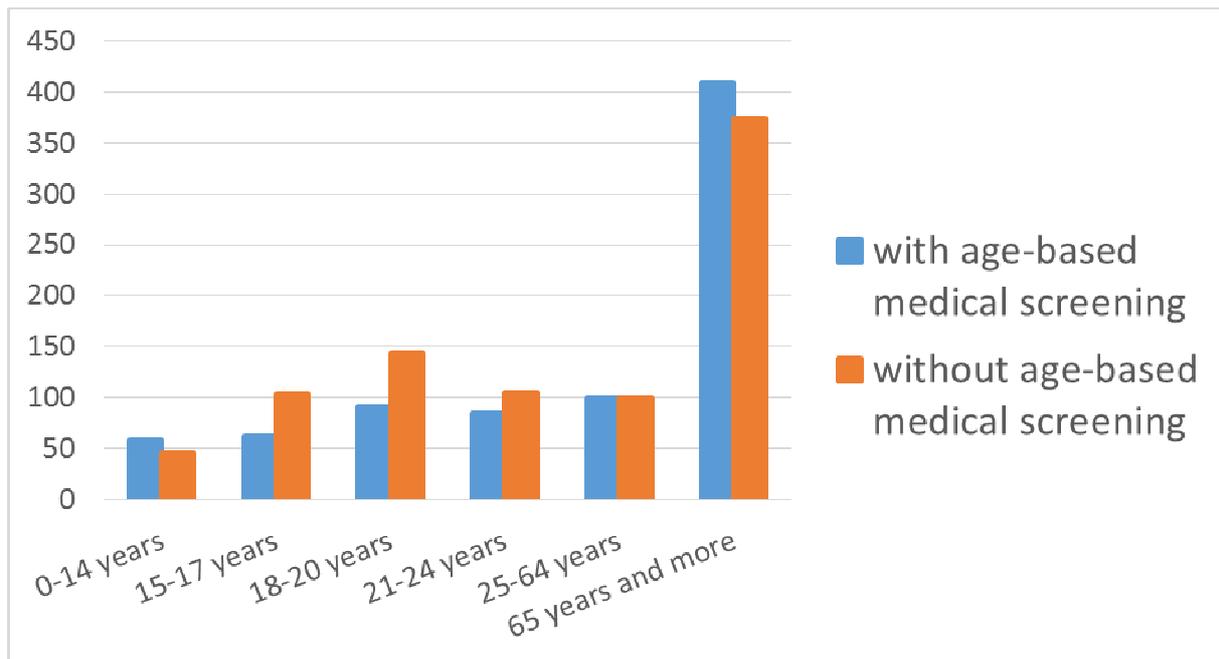


Fig. 5. Fatality rate of pedestrians per million inhabitants in countries with and without medical screening (indexed to age group 25-64)

Even if this kind analysis is not a proof of causation, it does fit to the results that other authors like Hakamies-Blomqvist et al. (1996), Mitchell (2008) or Siren & Meng (2012) and several non-European authors have found.

Future perspectives

Currently work is under way to improve the existing Swiss screening system. The following improvements are being discussed:

- 1.) In the future the focus should be more on medical conditions with an at least moderately increased accident risk and a substantial prevalence. According to Charlton et al. (2010) these are alcohol and drug dependence, cardiovascular disorders, dementia, epilepsy, sleep apnoea, cataract, as well as some psychiatric disorders like depression and schizophrenia.
- 2.) Better education of the physicians for the mandatory examination of older drivers is needed particularly on the possible problems when screening for diseases. When screening for dementia established tests like the Mini Mental Status Test (MMST) and appropriate procedures should be used to avoid unnecessary tests as well as too many false positives when testing. Applying the MMST (with 90% sensitivity and 90% specificity) for screening all drivers aged 70 and older (approximately 10% prevalence of dementia) leads to 50% false positives. Ways to prevent this include testing only when there is reasonable suspicion, screening only at ages with high prevalence (80 or older), repeated testing, and using higher scores or norms that include the educational level (Crum et al., 1993).
- 3.) The focus of the medical examination should be on medical treatment and rehabilitation as well as auxiliary measures (like additional mirrors for parking) instead of driver selection.
- 4.) More frequent issuing of licences limited with regard to travel time and region to minimize mobility deficits.

A special focus is currently on medication. It is known that medicine consumption increases with age. Also it is known that the culpability for a crash increases with psychoactive medication. As Dischinger et al. (2011) showed, the risk of being culpable for a crash increases by 1.89, 4.23 and 7.99 for one, two or three and more psychoactive medications for adults 45 and older. Special package instructions (pictograms) or warning labels will currently not be introduced in Switzerland. Instead a website, an Android, and iPhone app on medication prices were modified, so that special warnings are being shown for medicines that might impair driving. This applies to approximately 3,500 of the 25,000 medicines sold in Switzerland.

The screenshot shows the website www.mymedi.ch. The main content area displays the product Valium® (Diazepamum 10 mg) by Roche Pharma (Schweiz) AG. A warning pop-up is visible, stating: "Vorsicht ist geboten! Stesolid hat einen ausgeprägten Einfluss auf die Fahrtüchtigkeit oder die Fähigkeit Maschinen zu bedienen. Dem Patienten ist zu empfehlen kein Motorfahrzeug zu lenken und keine gefährlichen Maschinen zu bedienen, da die individuelle Reaktionsfähigkeit beeinträchtigt wird. Ferner ist der Patient vor gleichzeitigem Alkoholenuss zu warnen." Below the product information, there is a table of alternative products:

Alternative A	aktuell	SB	Preis p.E.	Tageskosten	Vergleich
G Stesolid, Tabletten/Stesolid Rectal, Mikrokisma (10 mg) ACTAVIS SWITZERLAND AG • TABLETTEN	19.80 CHF	10%	0.20 CHF	0.20 CHF	-45%
G Stesolid, Tabletten/Stesolid Rectal, Mikrokisma (10 mg)	8.30 CHF	10%	0.33 CHF	0.33 CHF	-9%

Fig. 6. Website www.mymedi.ch with an example of the road safety warning for Valium®

Apart from medical conditions and medication endangering traffic safety, normal age-related physical and cognitive changes have to be taken into account. One way to deal with these kinds of problems are self-assessments for the elderly that include advice on necessary or recommended actions. Although self-assessments have some problems like self-selection, lack of validation, or inappropriateness for drivers with significant cognitive impairments, they can be helpful. A good example is the Driving Decisions Workbook (Eby et al., 2000). Lang et al. (2013) presented an overview of different self-assessment systems. Such instruments will possibly play a significant role for elderly driver safety in Switzerland in the future. A project is currently underway.

The main reasons for the increasing fatal crash risk of the elderly per kilometre driven are their increasing frailty and the low-mileage bias (Whelan et al., 2006). The effect of frailty can be demonstrated when doing analyses of accident data by age and injury severity. Fatalities are increasing dramatically with age while lower injury severities are increasing much less.

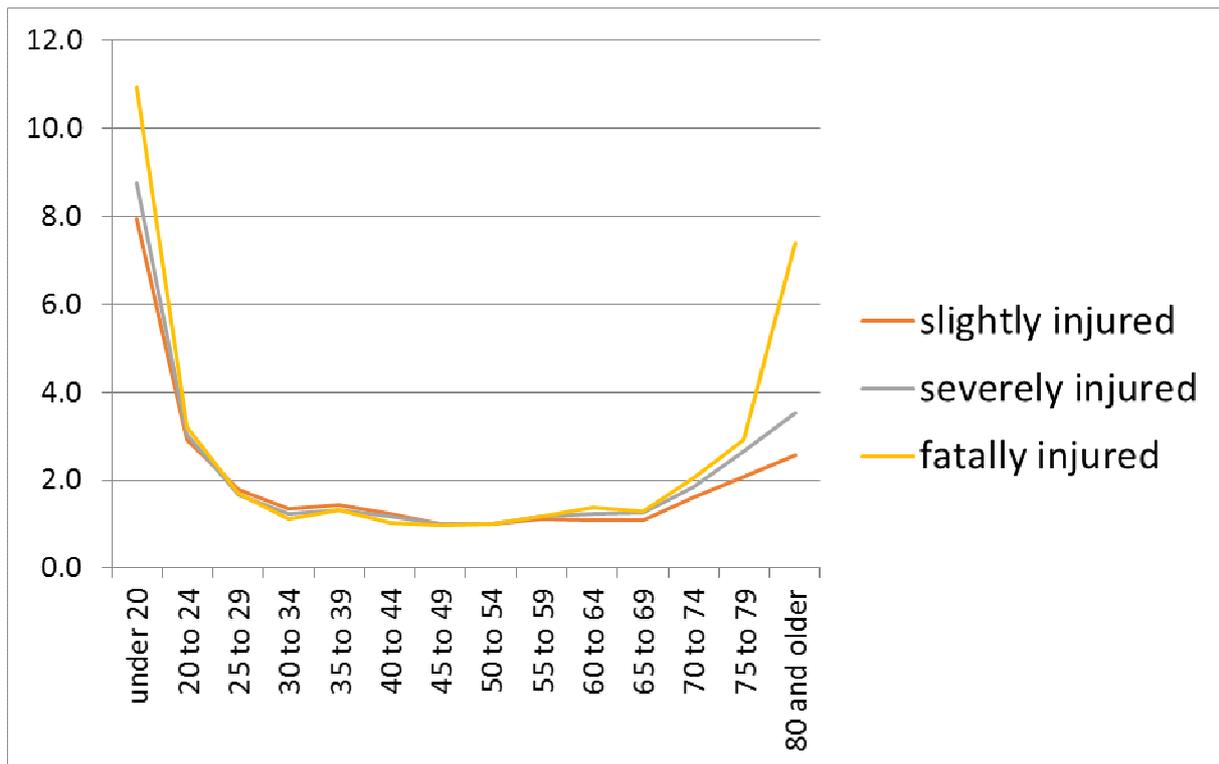


Fig. 7. Injury and fatality rate per 100 million kilometres driven in Switzerland (indexed for age group 50 to 54)

Cars with good crash test ratings can be helpful to compensate for frailty. Unfortunately today's cars are tested with crash test dummies that do not yet take into account the elderly frailty. Developments of dummies for the elderly are under way (for example EU-Project THORAX).

New cars with advanced driver assistance systems (ADAS) may be particularly helpful for older drivers to prevent crashes or reduce their severity. This includes brake assistant system, forward collision warning, parking assist system, lane departure warning, and lane change assistance. Although results on the systems effectiveness are still scarce, the expectations are quite positive. In a study of the AXA insurance (Jordan et al., 2013), it was found, that elderly drivers in Switzerland have a much more positive attitude towards ADAS than younger and middle-aged drivers. Possibly they see it as a help to drive safely longer.

From the traffic engineering side, self-explaining roads may help to better adhere to speed limits, and forgiving roads can reduce injury severity, especially in case of single vehicle crashes. Both strategies may be particularly helpful for the elderly.

For those elderly that are indeed unfit to drive, mobility should be sustained as good as possible since mobility is important for their social and mental well-being (Oxley & Whelan, 2008). Most elderly that are not able to drive anymore themselves have good access to public transport. In urban and suburban regions, the next public transport stopping point will be no further away than 300 meters from their homes. In rural areas this distance may increase up to 1000 meters. Unfortunately the extent of pedestrian fatalities of the elderly in Switzerland is quite high. Compared to Sweden, a country with one of the lowest rates in Europe, pedestrian fatality rate per 100'000 population is more than twice as high. Although this is due in part to higher exposure (longer walking distances), pedestrian safety is an important issue. Especially unsignalized pedestrian crossings are being improved (refuge isles, sufficient sight distances, minimum number of pedestrians, night visibility, no more than one lane per direction to be crossed) or removed.

In conclusion, it can be stated, that elderly are of increasing relevance to road safety. Since driving in a car is one of the safest modes of transport for them, this possibility should be maintained for as long as possible. Further progress in passive and active safety will help achieve this goal. Pedestrian safety should be given increased attention because the average pedestrian killed is 65 years old.

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