Comparison of European Countries with and without age based screening of older drivers

Heike Martensen & Kevin Diependaele
Belgian Road Safety Institute
Background: Ageing society in Belgium

Rising number of senior citizens in Belgium.

But less so than in other countries.
Background: Ageing society in Belgium

- Although victim numbers indicate vulnerable road users as main priority, most attention goes to elderly car drivers.

- In Belgium: unlimited license
- Since 2013: administrative renewal procedure every 10 years
  - Only for new licences
- Intensive discussion about possible selection mechanisms in Belgium
Look to Europe

Procedures to renew driving licenses in 27 EU countries:
- Unlimited validity
- Admin. procedure
- Medical check (age based)
- Medical check (all ages groups)

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Research question

- How does the fatality rate among car drivers in different European countries develop across the age-band?
  - Is there a reduction in fatality rate in the “screening countries”?
  - Can it be related to the age at which screening begins?
- How does the pedestrian fatality rate develop?
  - Is there an increase in pedestrian fatalities in the screening countries?
Analytic model

- Fatalities (CARE 2008-2012)
  - Car-drivers / pedestrians
  - By age-year
- Population (Eurostat 2008-2012)
  - By age-year

=> For each country, each time year and each age-year:
- \( p(\text{killed car-drivers}) / p(\text{not killed}) \)
- \( p(\text{killed pedestrians}) / p(\text{not killed}) \)
- Smooth non-linear function using thin plate regression splines (Wood, 2003)
- 95% confidence intervals
Driver fatality rates
Car-driver fatality rates per country
Screening practices

- Unlimited drivers’ license
  - AT, BE, BU, FR, DE, PL
- Administrative renewal of licenses
  - UK, SE
- Life-long screening (e.g. medical exams every 10 years)
  - ES, RO, LI, LT, HU, EE
- Age-based screening: examinations from 70 onwards
  - DK, FI, IE, MA, NL*
- Age-based screening: examinations from ages <70
  - 50: IT, PT; 60: CZ, LU; 65: EL, SK; SI*

*NL: changed to 75
**SI: changed to 70
Car-driver fatality rates - aggregation per screening practice
Car-driver fatality rates - aggregation per screening practice

Lifelong screening RO, HU

- administrative renewal
- age-based screening <70
- age-based screening 70+
- life-long screening
- unlimited licence
Car-driver fatality rates - aggregation per screening practice

Age based screening (starting 70): NL, DK, IE, FI

Administrative renewal: SE, UK
Car-driver fatality rates - aggregation per screening practice
Car-driver fatality rates - aggregation per screening practice

- Age based screening starts between 50 & 65
- Age based screening starts at 70
Results: driver fatalities rates

- **Age-based screening starting between 50 and 65 years**
  - Driver fatalities start rising earlier and more steeply than in other countries.
- **Age-based screening starting at 70 years**
  - “Good record” for younger ages levels away between 70 and 75 years.
- **Administrative renewal**
  - Countries keep their advantage.

- Across countries, age-based screening is associated with
  - earlier increase of driver fatality rate.
  - steeper increase
Pedestrian fatality rates
Pedestrian fatality rates - aggregation per screening practice

- Administrative renewal
- Age-based screening <70
- Age-based screening 70+
- Life-long screening
- Unlimited licence

Probability of being killed as a pedestrian

Age
Pedestrian fatality rates - aggregation per screening practice

- **Age based screening < 70**: IT, PT, CZ, SK
- **Unlimited licence**: AT, BE, FR, DE, PL
Pedestrian fatality rates - aggregation per screening practice

Age based screening (starting 70): NL, DK, IE, FI
Administrative renewal: SE, UK

Probability of being killed as a pedestrian

Administrative renewal
age-based screening <70
age-based screening 70+
unlimited licence
Results: pedestrian fatalities rates

- **Age-based screening starting between 50 and 65 years**
  - Cross-over interaction (as compared to countries with unlimited licence)
  - Lower fatality rates for younger ages
  - Higher rates for older pedestrians

- **Age-based screening starting at 70 years**
  - Reducing advantage (as compared to countries with administrative renewal)

- Age based screening countries show stronger increase in pedestrian fatality rates
- Increases in pedestrian fatality rate does not coincide with starting of screening practice.
Weaknesses of present study

- Fatality rates are corrected for population size of each age-year
  - Mobility not included
  - Differential changes in senior mobility cannot be taken into account

- Grouping of countries is based on screening practices
  - Possible differences within groups on other variables

- *Suggestions welcome 😊*
Conclusions

- Age based screening is associated with earlier and stronger increase of car-driver fatality rates.
- Differences between screening and not-screening countries coincide with starting age for screening requirement.

- Countries with age based screening show a stronger increase of pedestrian fatalities.
- Increase does not coincide with starting age for screening.

- There is no indication that countries employing age-based screening succeed in selectively prohibiting unsafe older drivers from driving.
Thank you for your attention!

heike.martensen@bivv.be
kevin.diependaele@bivv.be