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The International Commission for Driver Testing

"Safe Driving for Longer for Seniors: Can Emerging Technologies play a Role?

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Global Challenge due to Ageing

- **Diversity in older age**
- **The impact of inequality**
- **Outdated stereotypes and new expectations**
- **Contribution to the local and national economy**
- **The changing world- social structure**

Age related challenges faced by Older drivers

Ageing natural process

Ageing have impact on safe driving in different ways

Sensory changes: Eyesight

Cognitive Deterioration

Age-related reduced physical mobility

DfT, 2001

Older people being involved in road traffic accidents

Musselwhite and Hadded, 2007

Current Strategies Used by Older drivers and Evidence

- **Self- Regulatory practice used by older drivers for the driving task**
- **Concerns on the validity and accuracy of self-reported measurements of driving exposure and practice**

(Huebner et al., 2006; Staplin, Gish & Joyce, 2008; Staplin, Gish & Wagner, 2003).

Consequence of unplanned driving cessation

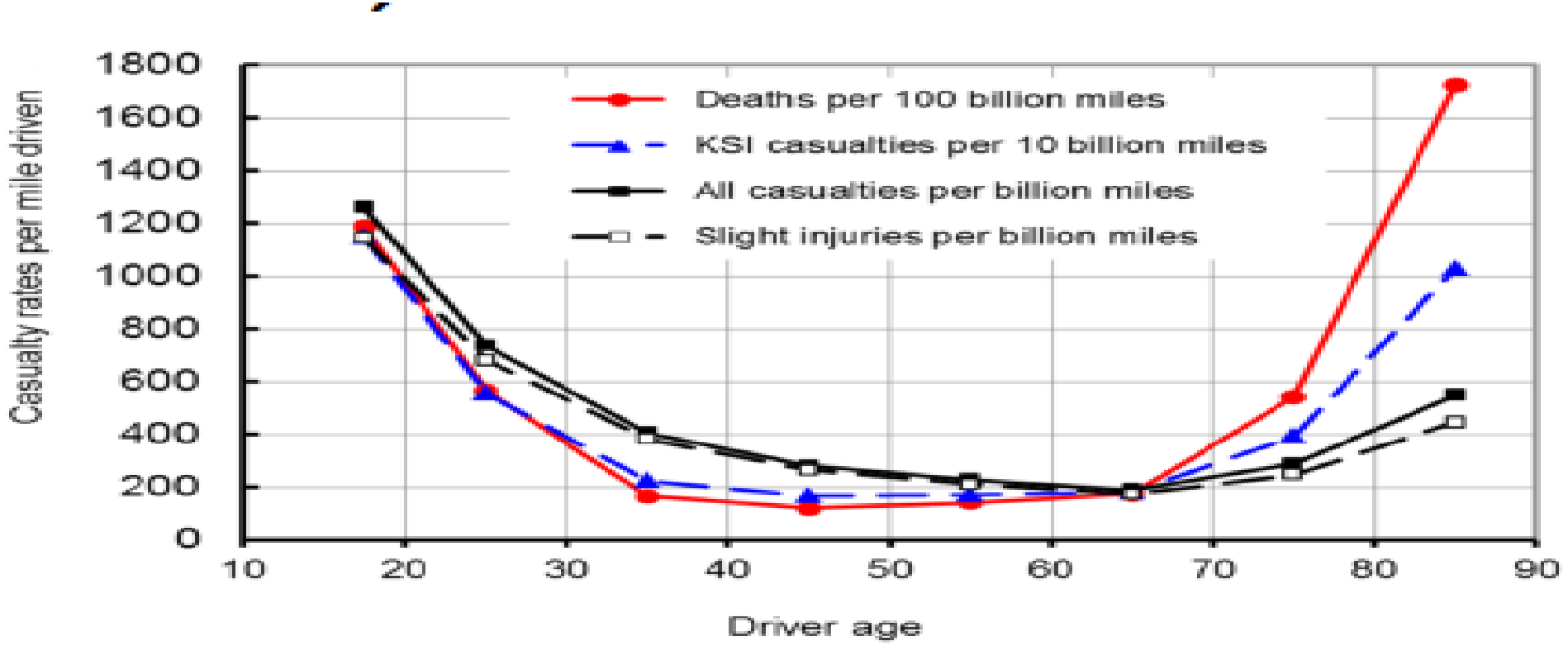
- Untimely, unplanned driving cessation raises another challenge for all stakeholders (Stutts et al., 2001)

- Driving cessation can have detrimental effects (Schlag et al., 1996) by increasing depression due to loneliness and not able to connect with others in the society (Fonda, et al., 2001; Ling and Mannion, 1995).

The most recent example is the 97 year old Duke of Edinburgh in the UK who was involved in a car crash in January 2019, when he was unhurt but has allegedly raised the same issue of how well older drivers self- regulate and comply with self-declaration of decline in health requirement of driving licence legislation.

BBC News, UK, 2019

Are older drivers unsafe drivers?



Mitchell, C.G.B. (2017). Are Older People Safe Drivers on the Roads, Testing and Training? In Musselwhite (ed.) Transport, Travel and Later Life (pp. 37–63).

Automation in cars & their potential for Seniors

SAE level	Name	Narrative Definition	Execution of Steering and Acceleration/ Deceleration	*Monitoring* of Driving Environment	Fall back Performance of *Dynamic Driving Task*	System Capability *(Driving Modes)*
***The human driver* monitors the driving environment**						
0	**no Automation**	the full-time performance by the *human driver* of all aspects of the *dynamic driving task*, even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a
1	**Driver Assistance**	the *driving mode*-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the *human driver* performs all remaining aspects of the *dynamic driving task*	Human driver and system	Human driver	Human driver	Some driving modes
2	**Partial Automation**	the *driving mode*-specific execution by one or more driver assistance systems of both steering and acceleration/ deceleration using information about the driving environment and with the expectation that the *human driver* performs all remaining aspects of the *dynamic driving task*	**System**	Human driver	Human driver	Some driving modes
***Automated driving system* ("system") monitors the driving environment**						
3	**conditional automation**	the *driving mode*-specific performance by an *automated driving system* of all aspects of the dynamic driving task with the expectation that the *human driver* will respond appropriately to a *request to intervene*	System	**System**	Human driver	Some driving modes
4	**high automation**	the *driving mode*-specific performance by an automated driving system of all aspects of the *dynamic driving task*, even if a *human driver* does not respond appropriately to a *request to intervene*	System	System	**System**	Some driving modes
5	**full automation**	the full-time performance by an *automated driving system* of all aspects of the *dynamic driving task* under all roadway and environmental conditions that can be managed by a *human driver*	System	System	System	**All driving modes**

SAE, 2014: SAE International standard J3016

What is available here and now as Automation (ITS – Intelligent Transport Systems)

- **Advanced driver assistance systems (ADAS)**
- **Adaptive Cruise Control**
- **Adaptive Light control**
- **Automatic Braking**
- **Automatic Parking**
- **Blind Spot Detection**
- **Collision Avoidance Systems**
- **Driver Drowsiness Detection**
- **Intelligent Speed Adaptation**
- **Lane Departure Warning Systems**
- **Night-Vision Enhancement Systems**

- **In-Vehicle information systems (IVIS):**
- Specialized traffic information systems, cell phones,
- Text messaging,
- Email,
- Vehicle diagnostics,
- Warning systems and
- Emergency help systems
- Telematics device

Challenges faced by Senior Drivers with semi to fully automation

- Users may not use the device correctly;
- The device can introduce a feeling of safety that can induce the person to take more risks;
- The device could not fit the specific driving characteristics of older drivers;
- The user may develop new behavioural patterns.

Simões and Pereira, 2009

- More likely to be distracted by technologies
- May take longer to process the information given by the technology

Musselwhite and Hadded, 2007

Reality Testing!!! For Older drivers & Stakeholders

- Usability
- Affordability
- Privacy and Confidentiality
- Human Machine Interaction – (especially for the Level – 3 automation)
- Autonomy?
- Unanswered questions – liability
- Constraints of Legislations
- Lack of adequate Regulations

Suggestions to meet challenges

- More needs to be done to understand the needs of older people and their capabilities as well as limitations when designing products
- Review and amendment in legislation such as the Vienna Convention 1968 (article 8)
- Exhibit 9: Aircraft and Automobile Software Code Compared (GAO 2016)

Watch the space for more information!!!

More concrete recommendations to be published as soon as my “Doctoral Thesis” has gone through the examination process…….

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