2018-10-30

Compliance and Appropriateness of Driver Vision Regulations in Ireland

Ciara McHugh
Technological University Dublin

Nabin Paudel
Technological University Dublin

James Loughman
Technological University Dublin, james.loughman@tudublin.ie

Matthew Sheehan
Technological University Dublin, 303078@tudublin.ie

Compliance and appropriateness of driver vision regulations in Ireland

Ciara McHugh, Dr. Nabin Paudel, Prof. James Loughman, and Dr. Matthew Sheehan

School of Physics & Clinical & Optometric Sciences, College of Science

Dublin Institute of Technology, Ireland

Background

Driving is a highly complex task which relies heavily on vision for successful execution. There are currently 2,820,528 holders of driving licences in Ireland [1]. Holders of a driving license must meet the standards for vision as set out by the Road Safety Authority Slainte agus Tiomáint document [2]. Visual acuity and Visual Field measurements are specified as the minimum standard. If there is reason to believe that these measurements are inadequate, it is required that the subject undergo a more detailed examination. Currently, drivers must undergo a vision screening when applying for their first license, and additional vision screening is not required until they reach 70 years of age. During this interval, licenses have 10 yearly renewal intervals. It is well known that a person's vision changes with age. These changes may be normal and age-related, or pathological and disease related. Either Way, these changes can have a significant detrimental effect on both unaided vision and corrected acuity, and therefore their ability to meet the driving standards (either with or without refractive aides). It is our aim to assess the vision of a sample population of drivers with respect to the current vision standards for driving, and to critically evaluate the appropriateness of the standards currently in place..

Objectives

The purpose of this study is to:

- Assess a sample of the Irish driving population's unaided vision, habitual vision, best corrected visual acuity (with existing spectacles, if applicable) with respect to the current driving guidelines as set out in Slainte agus Tiomaint [2].
- Investigate, by means of a survey questionnaire, driver habits and compliance with the current guidelines
- Explore any perceived barriers to compliance
- Explore alternative enforcement strategies
- Critically evaluate the current vision requirements for driving in an Irish context

Questions

Is the current visual acuity and visual field test adequate to properly assess a person's vision for driving? In light of a recent high profile case of a fatal road collision [3] caused by reduced visual field of the driver concerned, and failure to self declare this deficit to the relevant authority, we pose the question: Is self-declaration of vision deficits by the driver an adequate requirement in terms of public safety on our roads? The Useful Field of Vision [Fig. 1] is proposed by Ball *et al* [4] as a predictive metric of cognitive awareness of the visual scene with special relevance to driving.

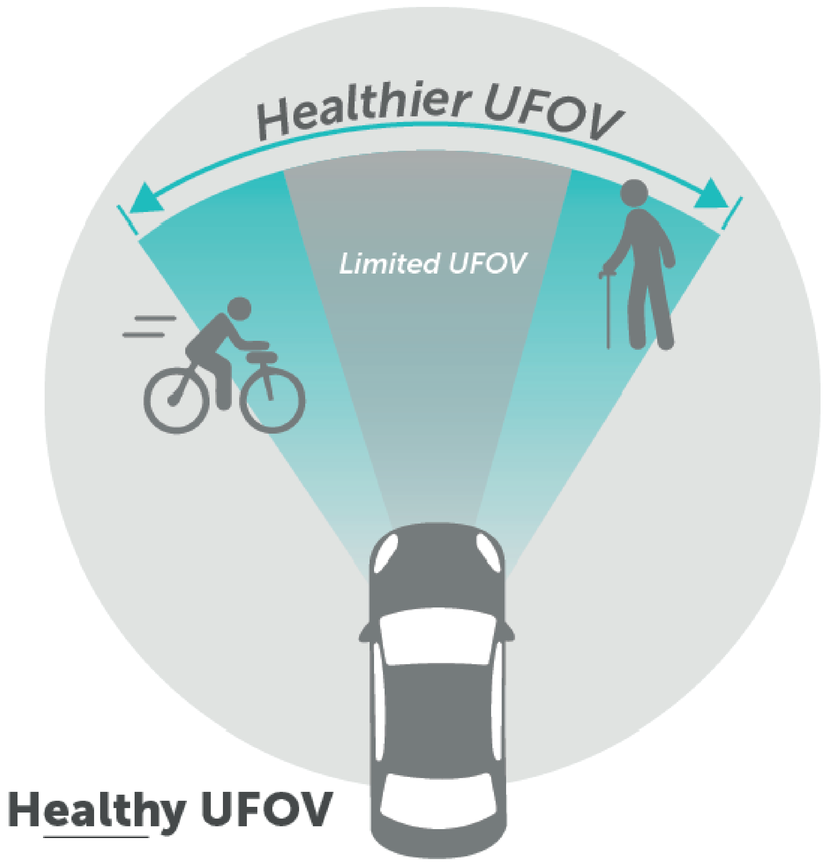

Figure 1. Schematic depiction of the Useful Field of Vision [4] of a driver. Pedestrians, bicyclists, and any other objects situated outside this field of view may not be detected, leading to delayed reaction in adapting to the driving situation and taking evasive actions.

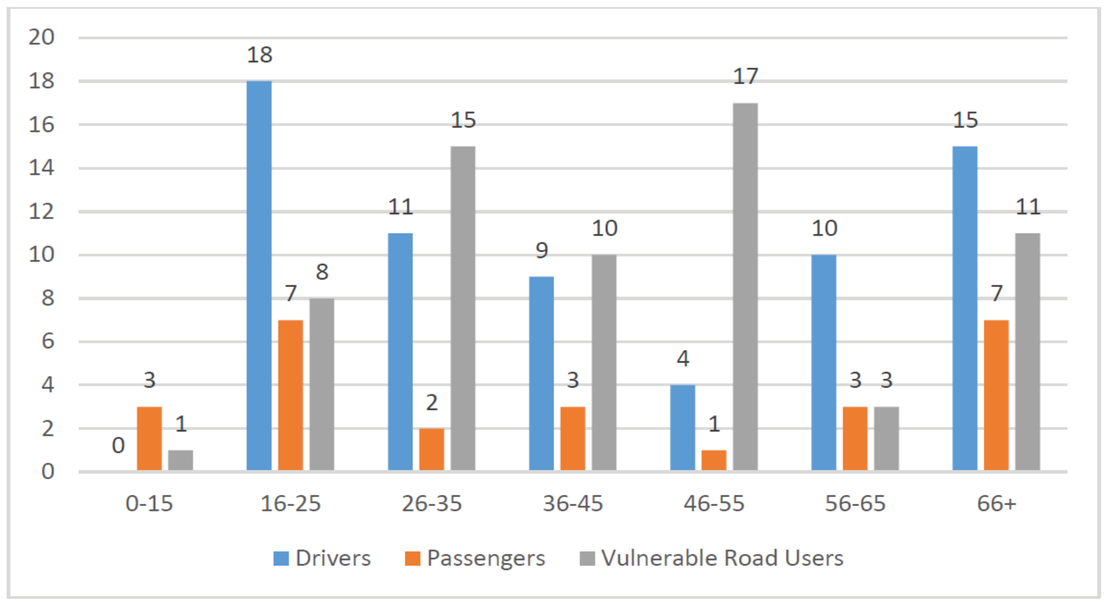

Figure 2. Deaths by age groups of drivers, passengers, and vulnerable road users in Ireland, 2017. Data from the Road Safety Authority [1].

Methodology

Subjects for the study will be recruited both from a sample of patients presenting for eye exams at an independent optometry practice in Co. Mayo, and at a large community event eg. County Fair.

All subjects will be asked to complete a survey regarding their current driving habits, whether they use a distance correction, and if they use it whilst driving.

The subjects will have their unaided vision measured. Their habitual vision and visual acuity with spectacle correction will also be measured.

Their visual field will be measured using Binocular Estermann Perimetry.

The results will be analysed so as to determine compliance with the current standards.

Anticipated Results

It is known that a person's vision changes as they age. These changes may be due to refractive changes within the eye, or as a result of pathological changes due to disease. It is generally accepted that the risk of refractive changes increases with age. There is a known increase in hyperopia with age. Studies have also reported increased anisometropia with age. Since the onset of both may be insidious, it is hypothesised that aging drivers may unintentionally fall outside the vision standards and may be unaware of their visual status. It is proposed that the long period between first receiving a driving license and the next mandatory vision screening at 70 years of age is a weakness in the current guidelines, and that there may be cause to suggest more frequent vision screenings be introduced. Figure 2 catagorizes the number of road deaths in Ireland in 2017 by age and road-user type. A large gap exists in knowledge regarding compliance, barriers to compliance, and enforcement strategies in Ireland. Work done in these areas would enable informed public policy and decision making with respect to eyesight requirements for drivers in Ireland.

Deliverables

There are valid and strong reasons for the proposed work to explore whether aspects of the current vision standards for driving are adequate and relevant, and to highlight specific limitations and areas where they might be improved. Approximately 3,000 casualties occur annually in the UK due to drivers having poor vision. These road accidents cost the UK an estimated £33 million a year. There is no similar data for Ireland. This study will offer a glimpse at a sample of the Irish population and their compliance with the Irish standards and their attitudes to same. The end result will inform public policy and decision making with respect to eyesight requirements for drivers in Ireland.

References

[1] Road Safety Authority (2016)

[2] Road Safety Authority Slainte agus Tiomáint (2017).

[3] Man found guilty of dangerous driving causing death, Raidió Teilifís Éireann https://www.rte.ie/news/courts/2018/0313/94716 (Accessed on 05/04/2018).

[4] The Useful Field of Vision schematic depiction. https://www.brainhq.com/partners/specialized-products-driving-safety/ufov (Accessed 24/10/2018), based on the work of Ball *et al,* Invest Ophthalmol Vis Sci. 1993 Oct;34(11):3110-23