A comparison of the interpretation of Esterman visual field charts using the Australian Assessing Fitness to Drive Standards 2012 and the UK Driver and Vehicle Licensing Agency 2014 guidelines.

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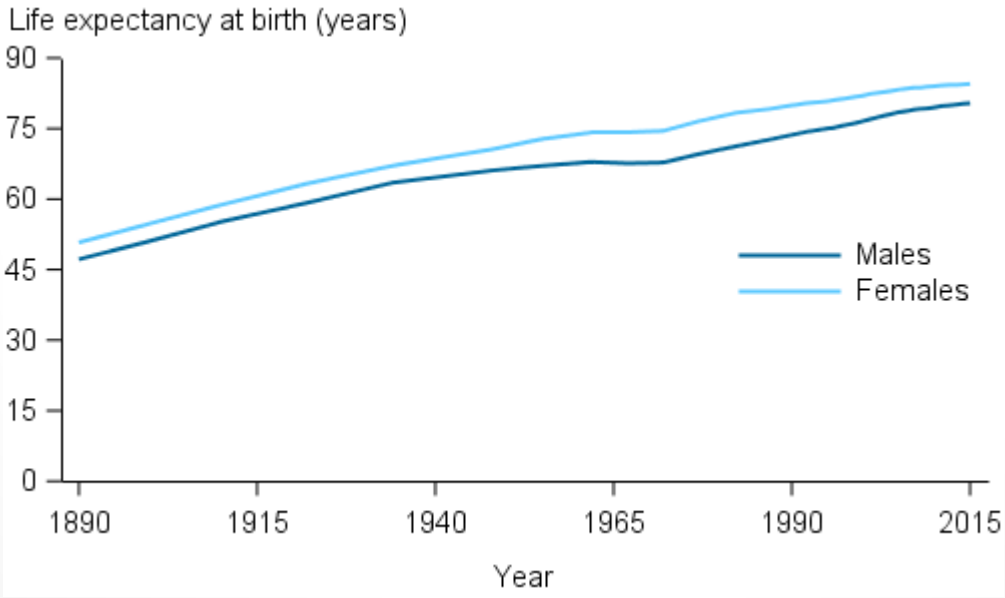
Background

- Increased life expectancy.
- Mobility plays a great role in how we perceive our self-reliance.
- Visual cues are crucial for safe driving performance.



Source: Australian Institute of Health and Welfare: http://www.aihw.gov.au/deaths/life-expectancy/#data

An example of vision with glaucoma.

The Australian Assessing Fitness to Drive (AFTD) 2012

- The Australian Assessing Fitness to Drive (AFTD) 2012 and visual field defects.
- Inconsistency of interpretation.
- The Esterman binocular field test.

Eye: Binocular

Name: TEST ZEISS
ID: 1955.1212.CA18.1E27.6629.CF43

DOB: 12-12-1955

Esterman Binocular

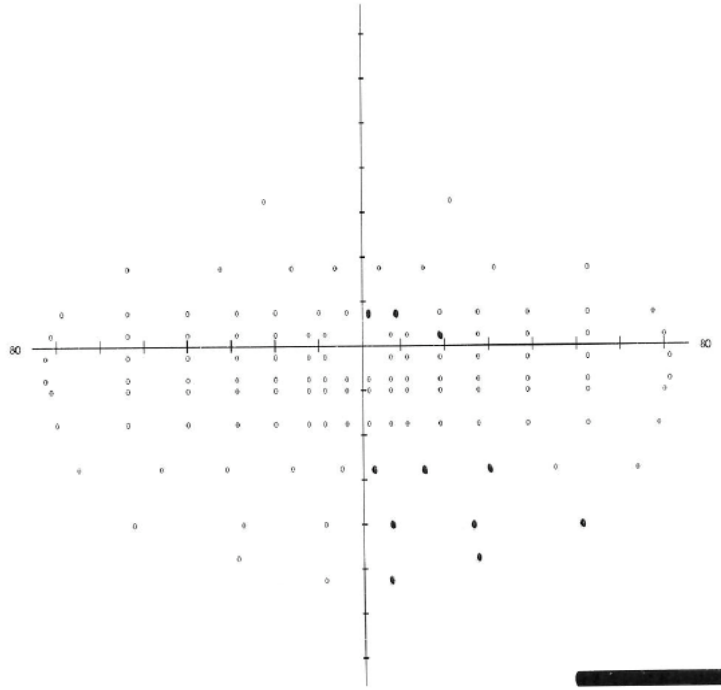
Fixation Monitor: OFF
Fixation Target: Central
Fixation Losses: 0/0
False POS Errors: 0/10
False NEG Errors: 0/8
Test Duration: 03:58

Stimulus Intensity: 10 dB

Stimulus: III, White
Background: 31.5 ASB
Strategy: Two Zone
Test Mode: Single Intensity

Pupil Diameter:
Visual Acuity:
RX: DS DC X

Date: 17-04-2015
Time: 12:10
Age: 59



◦ Seen 120/120
▪ Not Seen 0/120
△ Blind Spot
Esterman Efficiency Score: 100

[redacted]

HFA II 740-30205-5.1.1/5.1.1

The Australian Assessing Fitness to Drive (AFTD) 2012

- The AFTD 2012 defines but does not describe the visual field loss.
- It uses words with broad meaning such as *significant* and *likely*.

DVLA 2014 quantification of visual field anomalies.

- Clearly defined central vision loss.
- Clearly defined peripheral vision loss.

Defect affecting central area only (Esterman within 20 degree radius of fixation)

Only for the purposes of licensing Group 1 car and motorcycle driving:

- the following are generally regarded as **acceptable** central loss
  - scattered single missed points
  - a single cluster of up to 3 adjoining points.
- the following are generally regarded as **unacceptable** ('significant') central loss:
  - a cluster of 4 or more adjoining points that is either wholly or partly within the central 20° area
  - loss consisting of both a single cluster of 3 adjoining missed points up to and including 20° from fixation, and any additional separate missed points within the central 20° area
  - any central loss that is an extension of hemianopia or quadrantanopia of size greater than 3 missed points.

Defect affecting the peripheral areas – width assessment

Only for the purposes of licensing Group 1 car and motorcycle driving:

- the following will be disregarded when assessing the width of field
  - a cluster of up to 3 adjoining missed points, unattached to any other area of defect, lying on or across the horizontal meridian
  - a vertical defect of only single-point width but of any length, unattached to any other area of defect, which touches or cuts through the horizontal meridian.

Study aim

- To determine whether the use of the DVLA guidelines improve the ability to accurately determine the extent of the visual field when compared to the use of the AFTD 2012 guidelines.

Methodology

- A convenience sample of 10 medical doctors (raters), were recruited.
- Each rater assessed 6 Esterman perimetries using the AFTD 2012 instructions. The order was randomised.
- Nine months later each rater assessed the same 6 Esterman perimetries using the DVLA 2014 instructions.

Methodology

- Of the 6 Esterman tests:
  - 2 perimetries were deemed “Easy”
  - 2 were deemed to be of “Medium” difficulty
  - 2 were “Hard”

- Each rater was asked to determine whether the test met the criteria for unconditional licensing as stated in the AFTD 2012.

- The researcher then ascertained whether the doctor’s rating was correct or incorrect.

Statistical analysis.

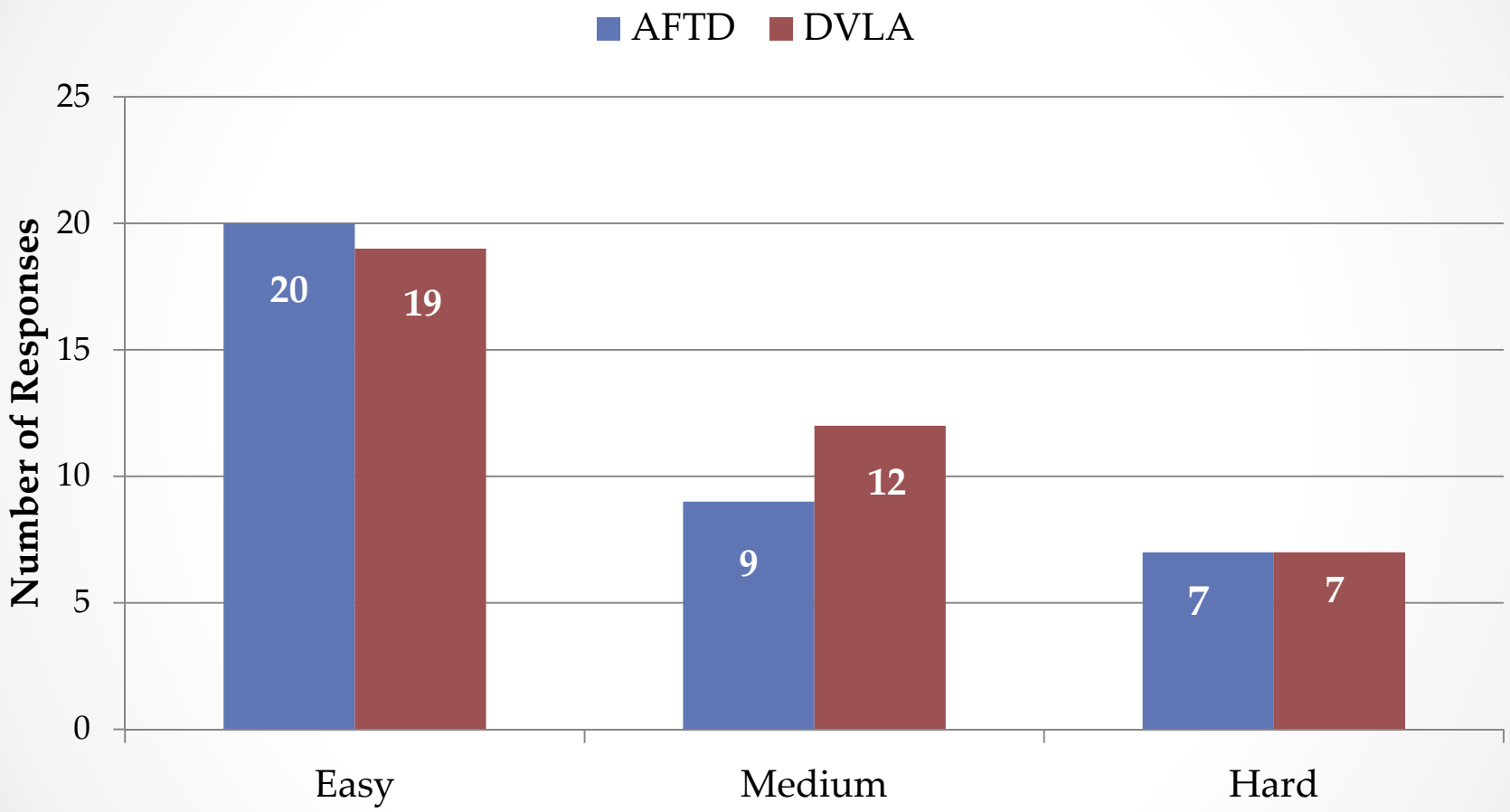
- It involved a comparison of the assessments across the batches for the matched Esterman and also the variation (or consistency) of assessment results within each of the two batches.
- We determined the association between proportion of correct judgements and type of guideline used.
- The analysis was repeated for each of the 3 difficulty levels.

Results

- N = 120 test results were returned
  (10 doctors x 2 conditions x 6 Esterman tests)

- 62% (n=74/120) were correct
- AFTD guidelines, 60% were correct (36/60)
- DVLA guidelines, 63% were correct (38/60)
- The type of guideline used was not associated with the proportion of perimetries that were correctly judged.

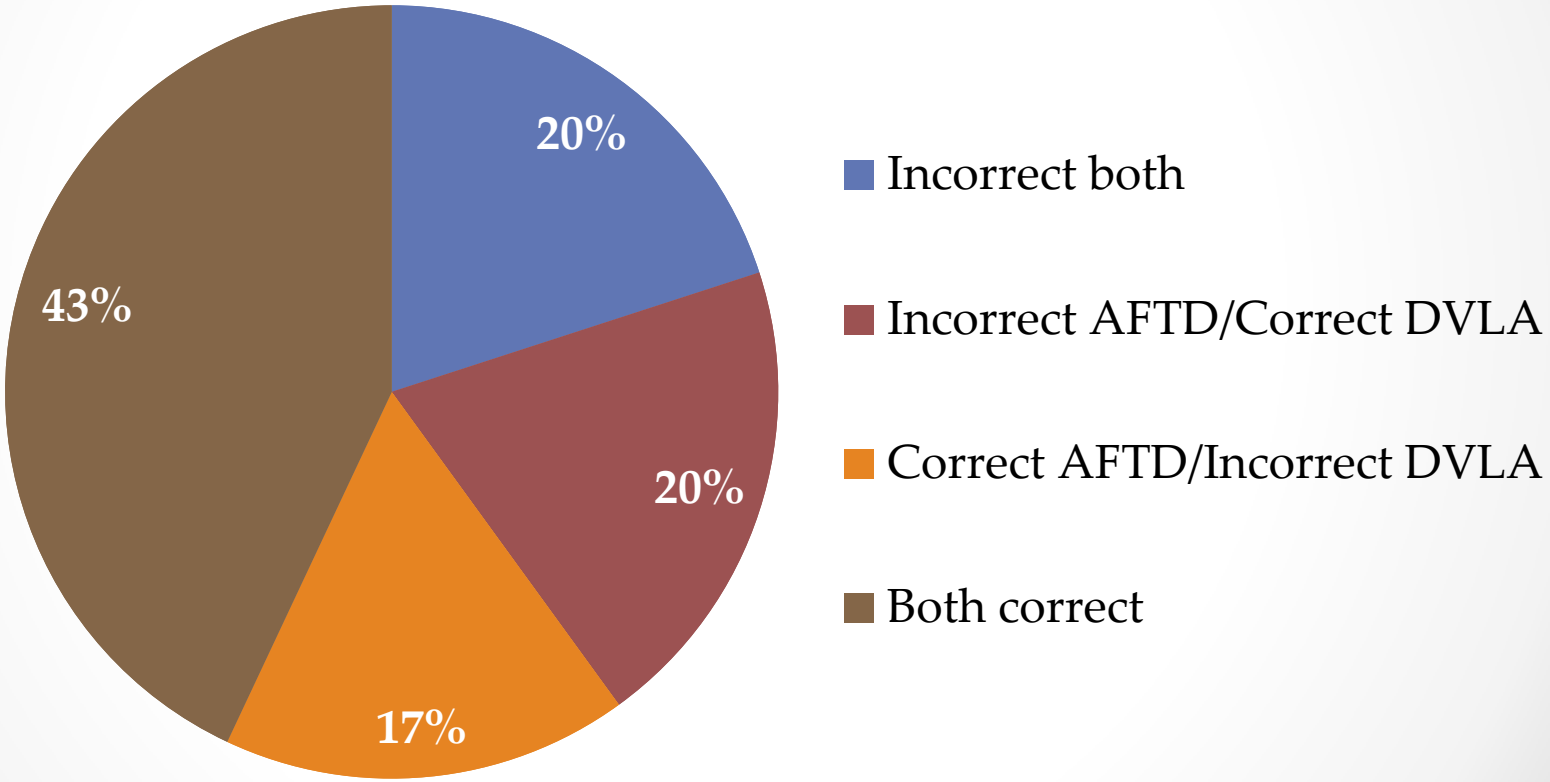
AFTD vs DVLA: Correct Judgements



Results

- Raters were correct in their assessments 50% to 83% of the time.
- With the DVLA guidelines:
  - 4 of the 10 raters performed the same (as with AFTD)
  - 2 performed worse and
  - 4 improved.
- None were able to correctly judge all the Esterman tests using the DVLA guidelines.

Outcomes of paired judgements on 60 matched Esterman perimetries (%)



Discussion

- The results off this study did not provide strong evidence that the use of the DVLA guidelines improved the ability to accurately determine the extent of the visual field when compared to the use of the AFTD 2012 guidelines

What could explain this?

- The lack of familiarity with the Esterman test.
- The raters saw no advantage in using the DVLA.
- Number of raters selected for this study and its limitation.
- Further research.

The Australian Assessing Fitness to Drive (AFTD) 2016

- In October 2016 Austroads and the NTC published an updated version of the AFTD (AFTD 2016).
- It made important changes in relation to how the calculation of the visual field extent should be done.
- These changes are in line with those proposed in this study.