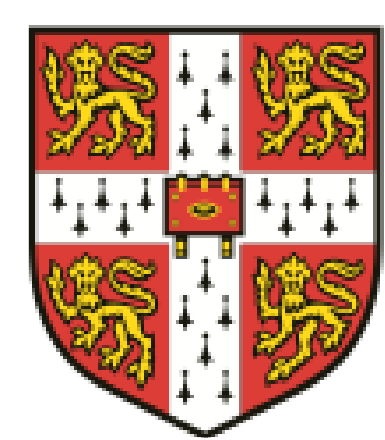




Feasibility of automated digital visual acuity testing in retinal clinics: a service evaluation

Automated visual acuity (VA) self-testing with DigiVis shows minimal mean bias vs standard ETDRS chart testing and high acceptability, supporting adoption in retinal clinics

Fig 1A:
Set up

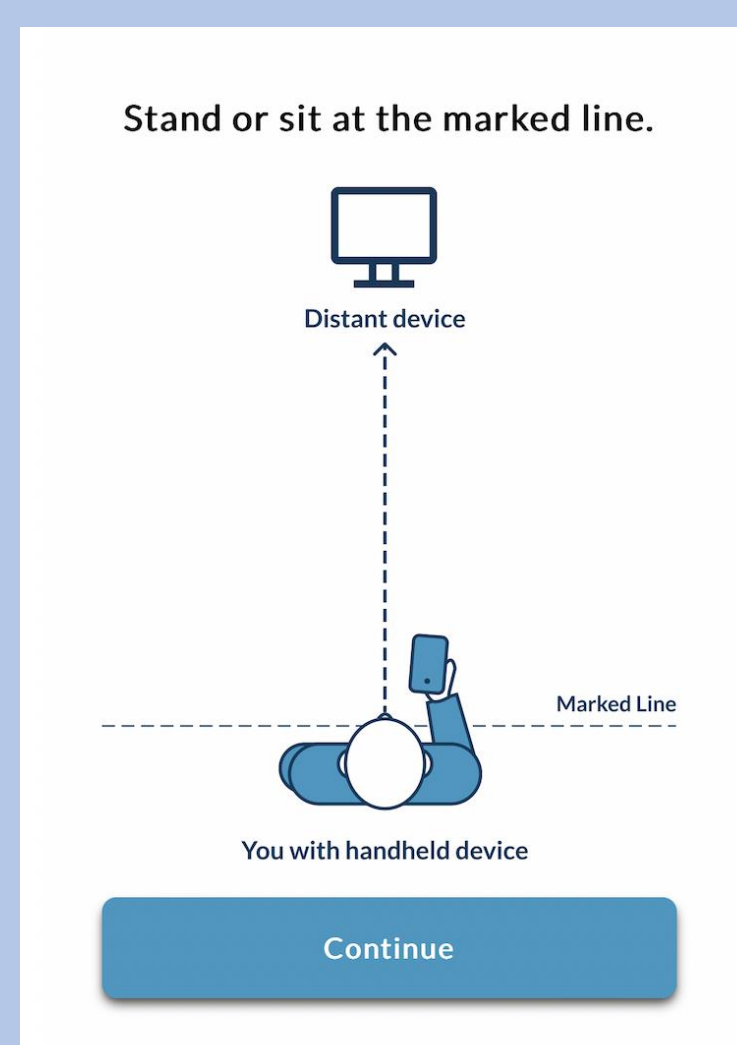


Fig 1B: Distant display

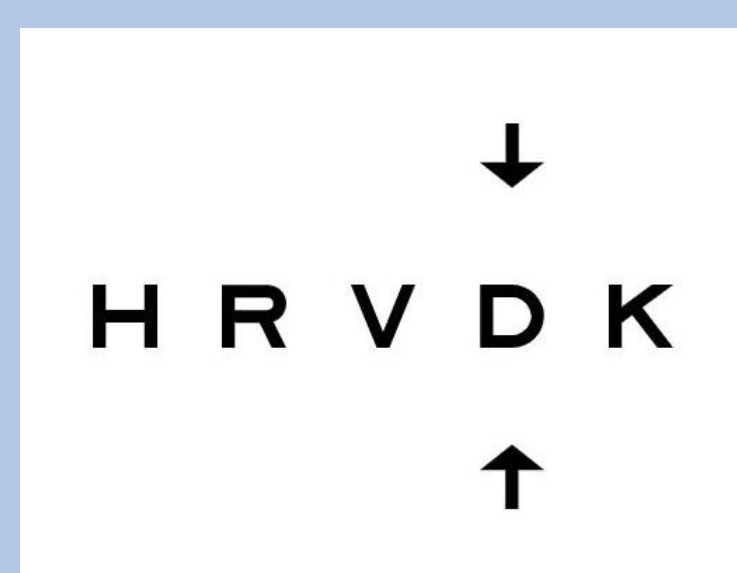
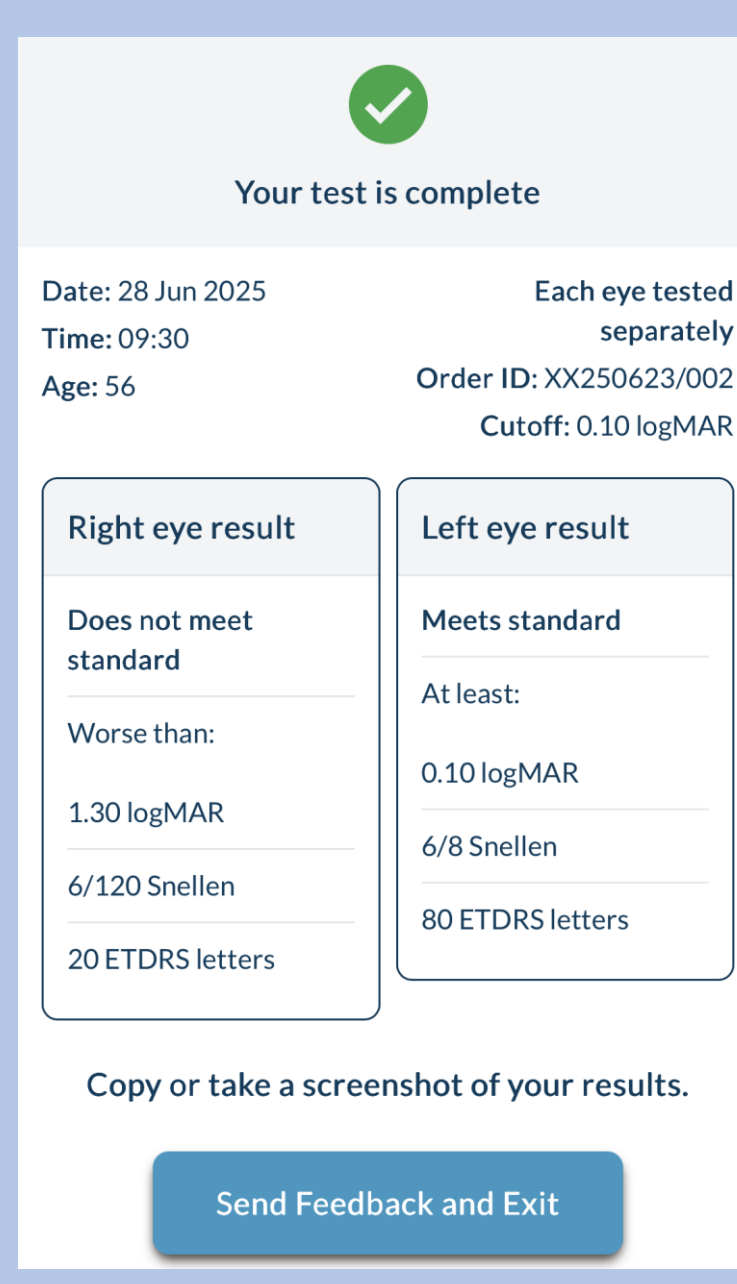


Fig 1C:
Handheld display



Fig 1D:
Results



Background

Approximately 9 million NHS ophthalmology clinic appointments take place annually, each requiring initial visual acuity (VA) assessment. DigiVis is a medical software enabling automated, self-assessment of distance VA which may speed up this process.

Objectives

Analyse agreement between DigiVis kiosk testing & standard VA assessment with ETDRS chart;
Evaluate usability/acceptability in patients attending retinal clinic.

Methods

In this service evaluation, 85 patients aged 25-90 (median 62.5, IQR 25) attending retinal clinics self-tested their VA using DigiVis following standard VA testing and completed a questionnaire addressing usability, confidence and test preference. Differences in VA test results were compared using Bland-Altman methods (Fig 2) and survey results were analysed by age (Fig 3). Exclusion criteria were VA>1.0 logMAR, cognitive impairment, and non-conversational English. Only one randomised eye per patient was used for analysis.

Results and discussion

Test agreement

DigiVis demonstrated a mean bias of -0.043 logMAR (95% CI -0.065 to -0.022), indicating a small (~2 logMAR letters) relative overestimation of VA compared with standard testing. Limits of agreement (LOA) were +0.15 (95% CI 0.12 to 0.19) and -0.24 (95% CI -0.28 to -0.20) logMAR.

The observed mean bias was modest. The mean LOA of +/- 0.195 logMAR falls within accepted clinical test-retest repeatability standards for VA measurement (~0.20 logMAR).

Acceptability

78 (89%) patients found DigiVis easy to use and 77 (86%) would use it to reduce waiting time. 61 (68%) expressed a preference for standard testing, primarily for human interaction in clinic. 68 (76%) appreciated the opportunity to be able to monitor their vision at home. Answers were not significantly associated with age ($p>0.05$).

Conclusions

DigiVis self-testing demonstrated acceptable levels of agreement with standard VA testing and had high patient acceptability among adults attending retinal clinics. These findings support the feasibility of implementing DigiVis for kiosk and home monitoring pathways for this patient population.

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Fig 2: Bland-Altman Plot: DigiVis vs Standard (logMAR) (n=85)

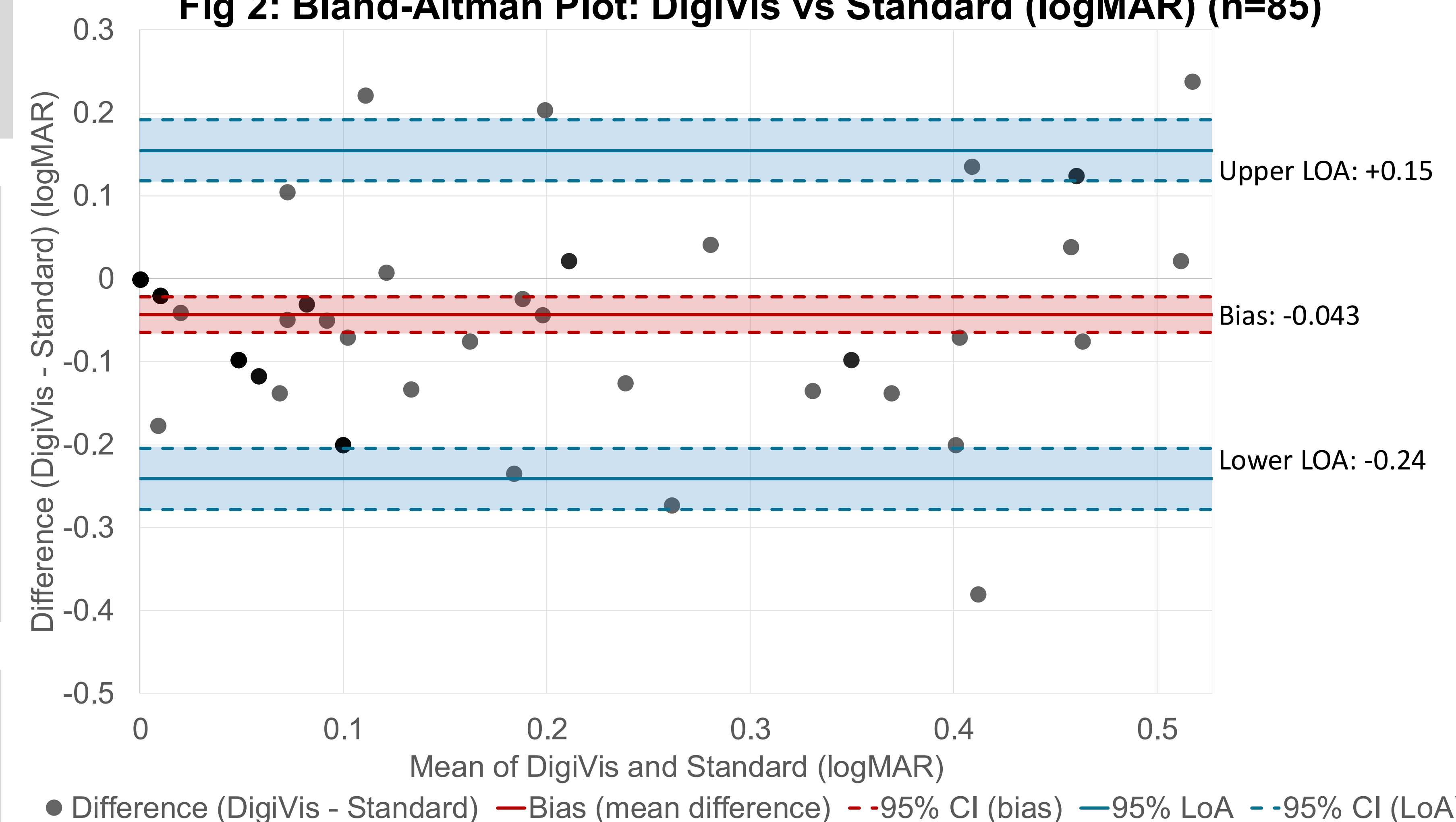


Fig 3: Acceptability: % of agree/strongly agree with below statements (n=90)

