

Chaturvedi A, Coull E, Nauman A, Sahgera A, Silcock HC, Kennedy GJ

Tallaght University Hospital, Dublin, Ireland

Department of Vision Sciences, Glasgow Caledonian University, Glasgow, Scotland

## INTRODUCTION

**Primary Open Angle Glaucoma (POAG)** affects over half a million people in the UK (1) and accounts for 20% of hospital eyecare appointments (2). To reduce the burden of care in Hospital Eye Services in Scotland, novel **community monitoring schemes** have been developed for patients with **low risk, stable glaucoma**.

## WHAT IS NESGAT?

The NES Glaucoma Award Training (NESGAT) program equips **optometrists** with **advanced skills** for **glaucoma care** in the **community** (3). So far, several cohorts of optometrists have graduated and are delivering high quality specialist management via **Community Glaucoma Assessment (CGA)** schemes.

## PURPOSE

Through a mixed methods approach, we examined **perspectives** on a novel community glaucoma assessment pathway and evaluated the use of the **VisionOne** device that combines Artificial Intelligence (AI) and Virtual Reality (VR). VisionOne uses **Sequentially Optimised reconstruction strategy (SORS 20)** which is a **new perimetry test** that evaluates **fewer visual field locations** and estimates the rest (4), improving **efficiency and accessibility**.

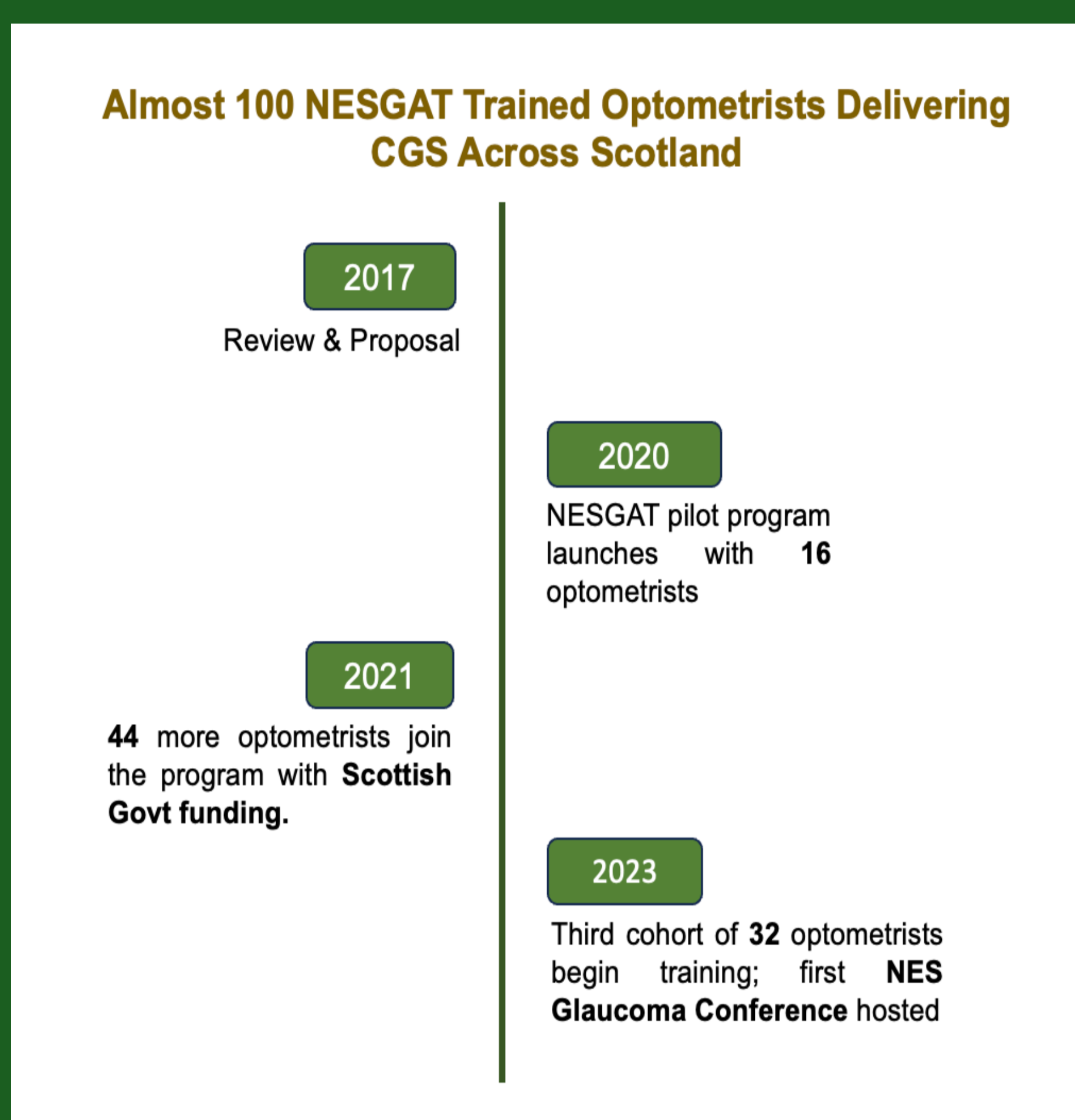


Figure 1: Timeline for the Implementation of the NESGAT Programme

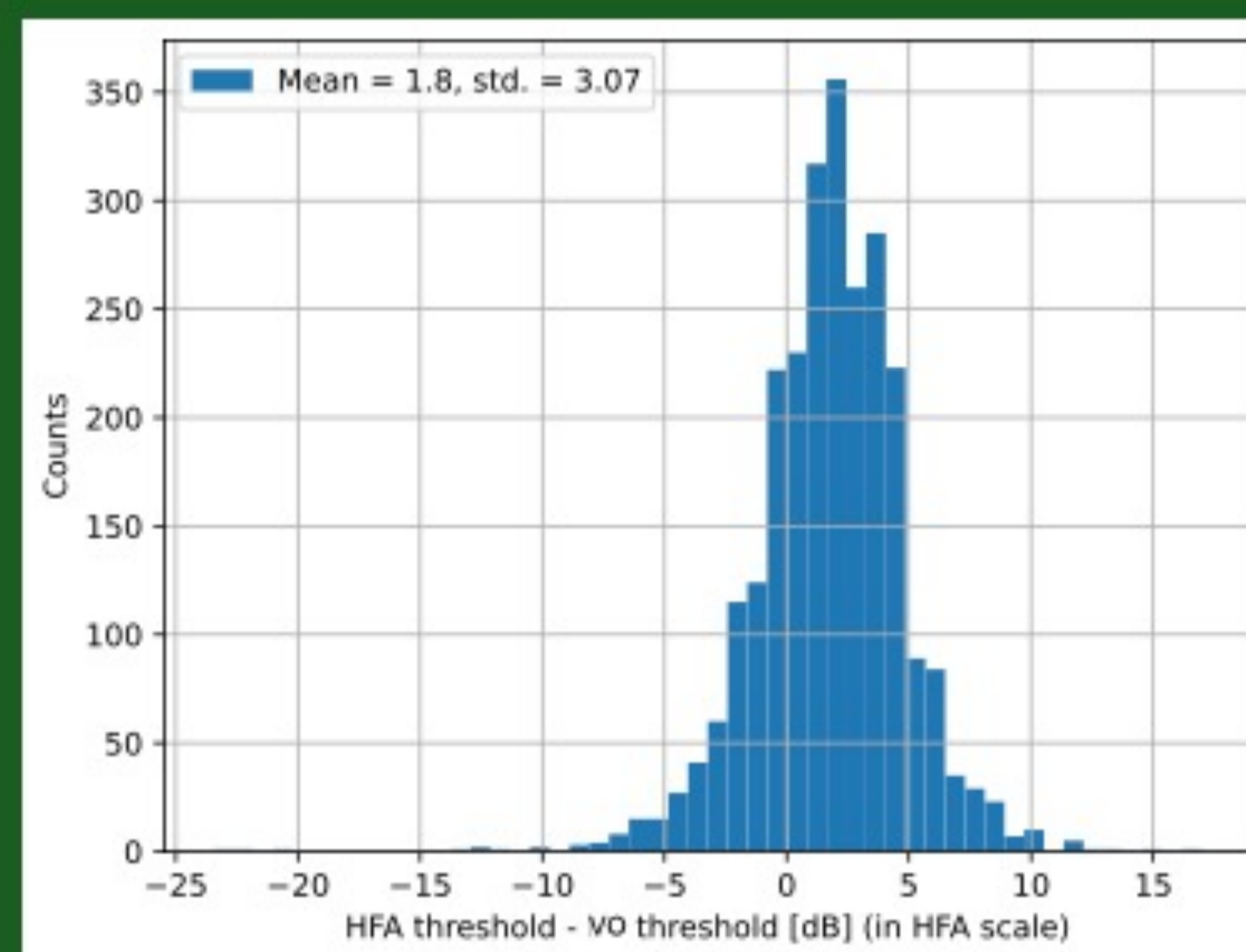


Figure 2: Comparison of threshold sensitivities between HFA and VO

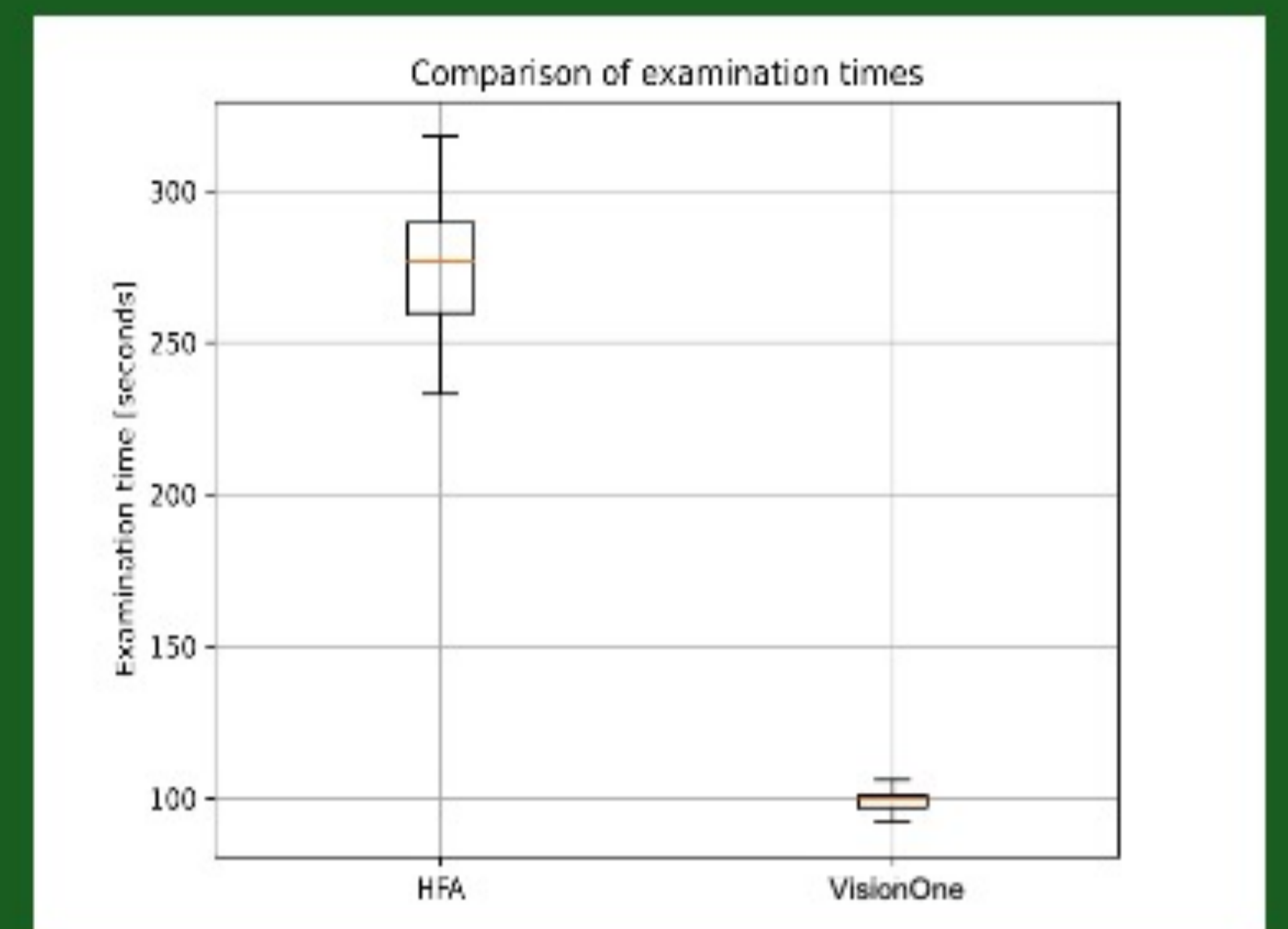


Figure 3: Comparison of Test Duration between SITA Standard and SORS 20 test strategies

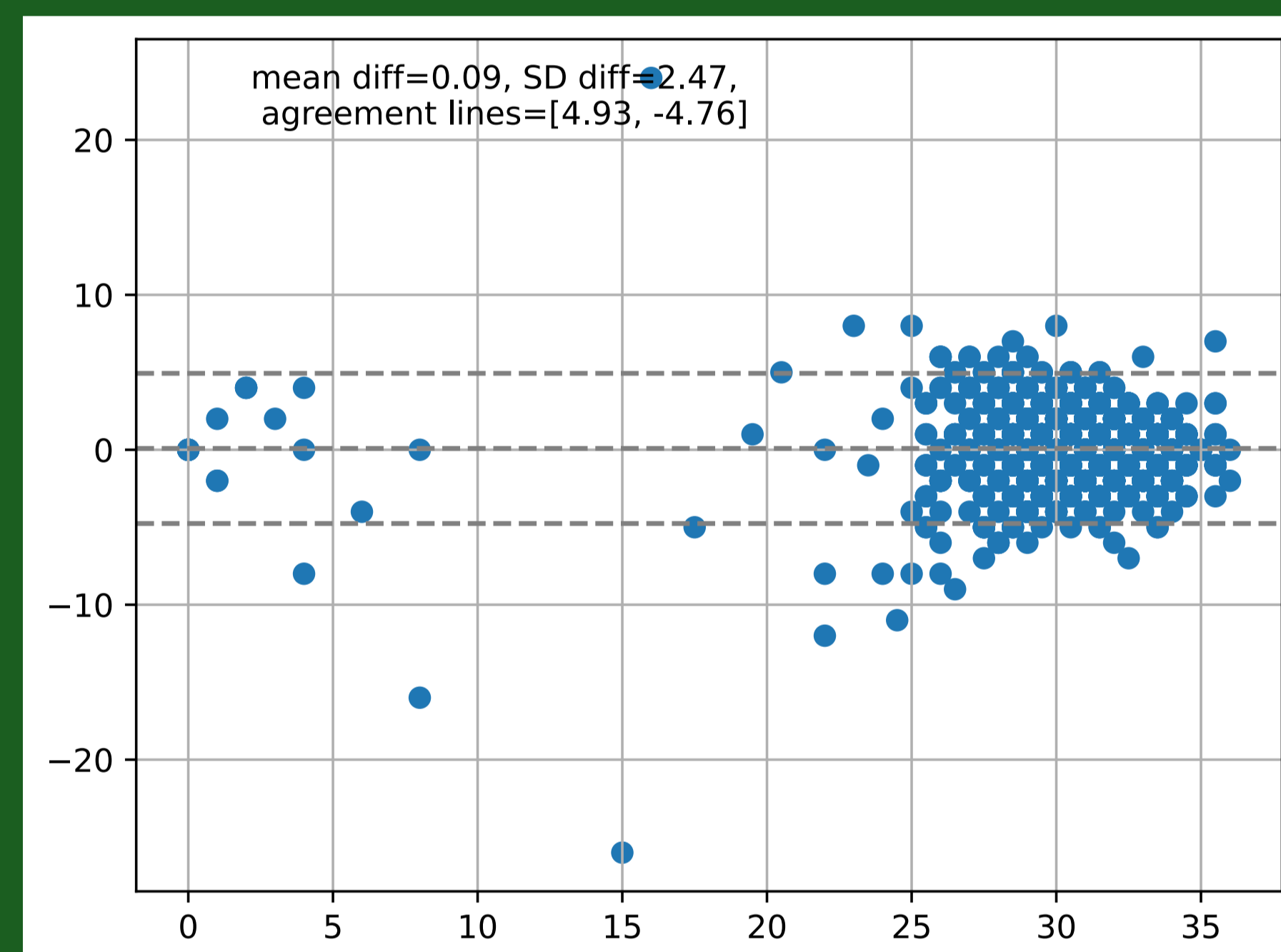


Figure 4: Bland Altman plot showing test-retest variability for SITA Standard

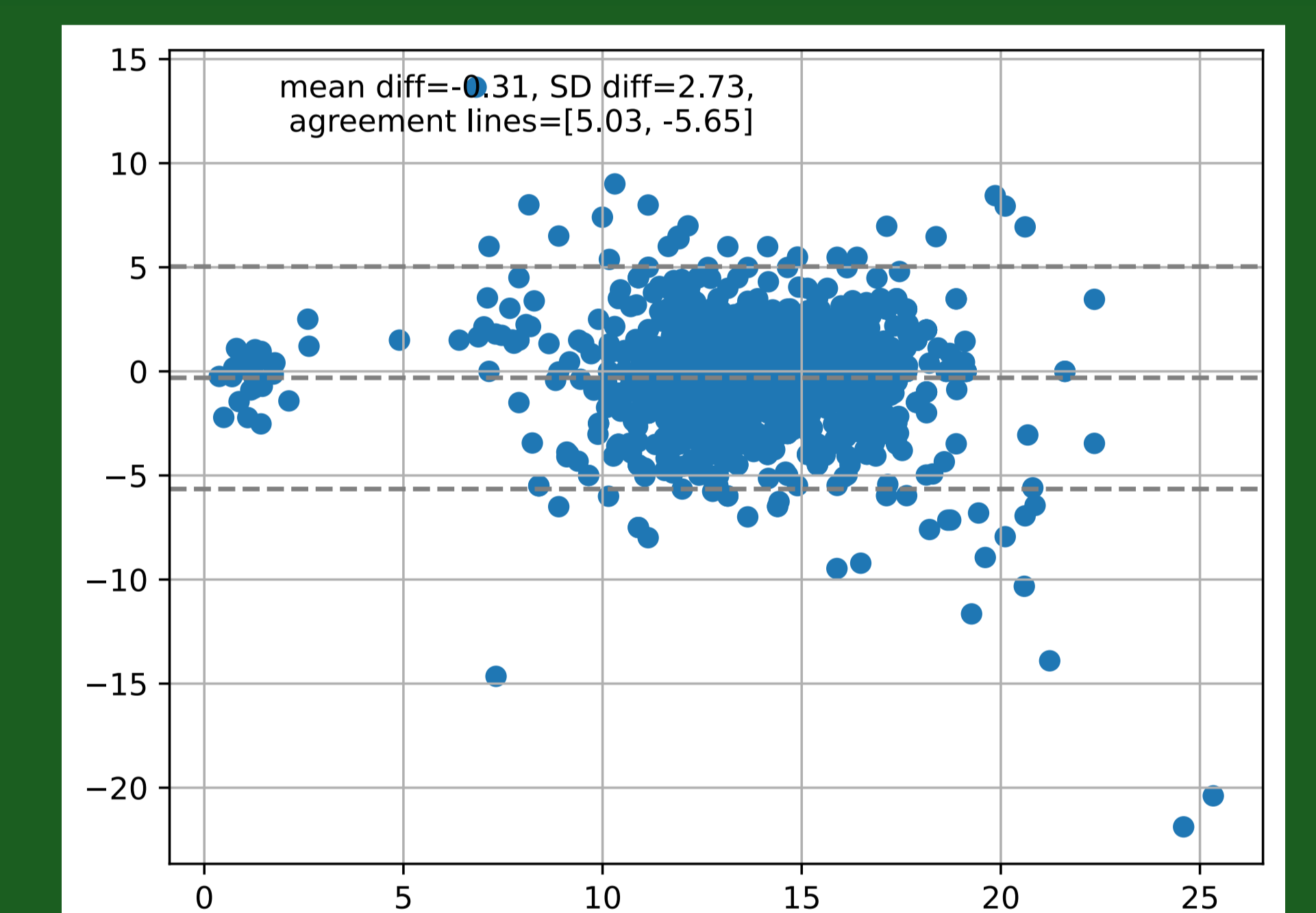


Figure 5: Bland Altman plot showing test-retest variability for SORS 20

## METHODS

Two Independent Analyses were carried out.

### 1. Feasibility of VR based perimetry

**Participants:** 16 healthy **adult** volunteers (ages 20-59, mean age 28) underwent visual field tests in GCU on both eyes using:

- **Test Pattern 24-2 (SITA Standard) on HFA**
- **SORS 20 on VisionOne (VO)**

Tests were repeated on a separate day. Volunteers then completed a follow-up usability questionnaire.

**Analysis:** Test times were compared between SORS and SITA Standard and **test-retest variability** shown via **Bland-Altman plots**.

### 2. Implementation of NESGAT

**Participants:** **Ophthalmologists & Optometrists** across Scotland participated in **questionnaires, semi-structured interviews and focus group** discussions on:

- Current capacity issues
- Barriers to community glaucoma monitoring
- Appropriate reimbursement rates

**Analysis:** **Thematic** analysis of questionnaire data and user perspectives on using a **VR Perimetry platform (VisionOne)**.

## RESULTS

### 1. Feasibility of VR based perimetry

- **Threshold Sensitivities:** Mean difference between HFA and VO was 1.8 (SD 3.07) (Figure 2).

#### • Test-Retest Variability:

- HVF 24-2: Mean difference = 0.09 (SD 2.47); 95% LoA -4.76 to 4.93 (Figure 4).
- VO: Mean difference = -0.31 (SD 2.73); 95% LoA -5.65 to 5.03 (Figure 5).

- **Test Time Comparison:** **SORS** was **59% faster** than SITA-Standard (290 seconds; [SD 18] vs 707 seconds; [SD 71]) (Figure 3)

**User Experience:** **100%** of participants agreed or strongly agreed they could perform visual field testing on a **VR** headset, and **75%** found the VR-based test **more pleasant**.

### 2. Implementation of NESGAT

**Main Barriers to CGA:** **75%** cited **inadequate reimbursement** rates or difficulty conducting visual field tests as barriers. Additional **training** required to become NESGAT-certified and the **opportunity costs were also significant barriers**.

**Optometrist Willingness:** Most optometrists are willing to expand community glaucoma assessment if an **automated, integrated and faster visual field testing** strategy is available.

## CONCLUSION

The NESGAT pathway has the potential to transform community glaucoma care by improving patient **access and clinical outcomes**, though significant **barriers such as training and resource allocation** remain.

**VR based perimetry** can be **faster** and more **pleasant** than traditional HFA testing methods. Both HVF and VO exhibit **comparable test-retest variability**, suggesting that the VisionOne device is a **reliable** alternative for visual field testing in a community setting.

### Key Takeaways

- Efficiency: **SORS** reduces test time by 59% compared to SITA-Standard.
- User Experience: **High satisfaction** with VR-based virtual field testing.
- Reliability: Test-retest variability supports VO's accuracy.
- Training Needs: Extensive **training** for NESGAT certification is a major barrier
- Reimbursement: **Inadequate rates** are a primary concern for optometrists

## REFERENCES & CONTACT INFORMATION

