Large-Scale, Real-World Collection of Refractive Outcomes After Cataract Surgery Through Patient-Mediated Mobile Photography

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Background

The 2021 joint guidance from the Royal College of Ophthalmologists and the College of Optometrists recommends discharging routine post-cataract patients directly to community optometry, with refractive outcomes returned to the operating centre for audit.

Establishing this data return is challenging - it requires electronic integration between community optometry systems and hospital records.

In the National Ophthalmology Database Cataract Audit (8th Annual Report), post-operative refraction data were available for a median of only **62.8% of eyes**, and **11% of sites returned data for fewer than 10% of patients.**

Optometrists are legally required to provide patients a written prescription on request. This printed refraction, often including visual acuity, offers a practical patient-mediated channel for outcome collection.

We evaluated whether a mobile-phone-camera-based approach could achieve accurate, scalable data capture in a cataract population.

Methods

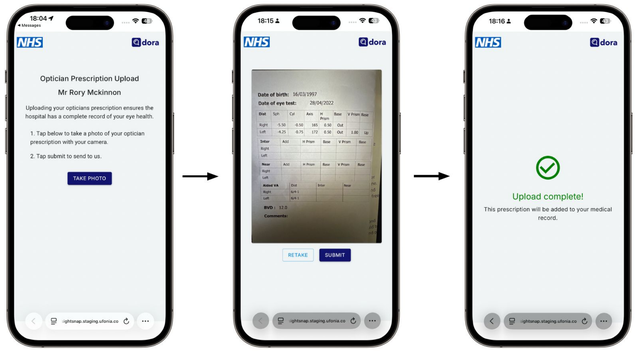
Sightsnap (Ufonia Ltd, Oxford) enables patients to photograph their optometrist's printed refraction and submit it via a web link delivered by SMS. Computer vision extracts sphere, cylinder, axis and visual acuity values with **99% accuracy.**

Sightsnap integrates with **Dora**, an AI telephone service deployed at participating sites for pre- and post-operative care; refractive outcome collection extends an existing patient-facing pathway, requiring no additional clinical-team action.

Outcome data are returned as structured reports or exportable datasets, and can be combined with other patient-level data held by the system.

Setting

- 14 cataract providers across South East England
- Evaluation period: January – November 2025
- All post-operative patients with a recorded mobile number invited via a single automated text message
- Standard-of-care service evaluation



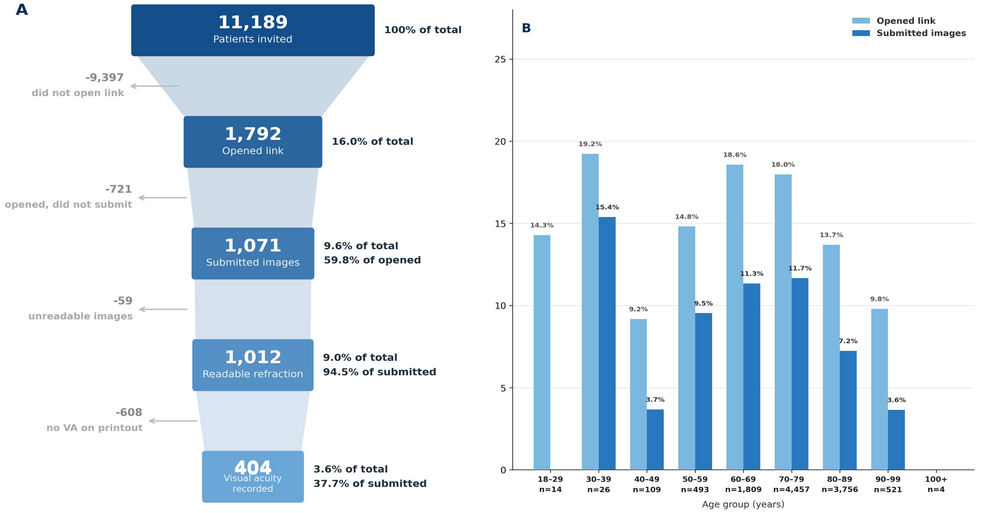


Figure 1. (A) Engagement cascade from invitation to data extraction across 14 providers. (B) Rates of link opening and image submission by age group.

Patient journey using Sightsnap

SMS link — Automated text message sent post-operatively with secure web link

→ **Photograph** — Patient photographs optometrist's printed refraction prescription

→ **Submit** — Image uploaded via the web link — no app or account required

→ **Extract (99%)** — Computer vision extracts sphere, cylinder, axis & VA values

→ **Return** — Structured outcome data returned to the clinical record

No app installation, account creation, or EHR integration required.

Key results & Conclusion

11,189	1,071	60%	94%	3 – 16%
patients invited	image submissions (9.6%)	of link openers submitted	submissions readable	completion across 14 sites

- Post-operative refractive data can be collected at scale using only a mobile phone camera **— bypassing longstanding interoperability barriers between community optometry and hospital systems.**
- Engagement was strongest in older adults (60–79 yrs), countering assumptions that technology-enabled capture is unsuitable for this population.
- Constraints: not all patients attend community optometry, retain their printout, or own a camera-enabled smartphone. A single early invitation likely under-estimates eventual capture, since many patients are refracted only after second-eye surgery.
- Structured onboarding, improved communication to community providers, and well-timed prompts could increase submission rates. This pragmatic, low-cost approach offers a **scalable model for outcome-data collection across community-delivered cataract pathways.**

Disclosures

AH, EL, LW, JT, LS and JG are employees, and NdeP is a shareholder of Ufonia Ltd. CK has received consultancy fees from Alcon relating to Toric lenses. MC, RT, EA, AK and SA declare no competing interests.

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Ufonia

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