Methods for a population-based Comprehensive Eye care Workload Assessment (CEWA) study in Southern India

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Introduction

- In many developing countries, eye care programs are typically planned based on the **prevalence of blindness and visual impairment**, often estimated from **Rapid Assessment of Avoidable Blindness** (**RAAB**) surveys.
- This approach, however, **fails to account for the full annual eye care needs** of the population.
- **Planning targets are often arbitrary**, driven more by capacity than by actual demand.
- Currently, there is **no standardized method** to quantify the **met, undermet, and unmet** annual eye care needs of a population.

Purpose

To develop a **novel framework** for estimating the **annual demand for comprehensive eye care services** in a population of **1.2 million**.

Methods

Study design *(Figure 1)*

- **Type**: population-based prospective cross-sectional study
- **Location**: Theni district, India (2016 – 2018).
- **Population**: 1.2 million.
- **Sampling**: 34 randomly selected clusters (17 rural, 17 urban) using **probability proportional to size**.

Participants

- Included **all permanent residents** of all ages from selected households (HH).
- Study conducted in **three phases**: 1) HH enumeration 2) Tracking eye care utilization post-enumeration 3) Comprehensive Eye Examination at 1-year post-enumeration: Basic Eye Examination (BEE) and Full Eye Examination (FEE) one-year post-enumeration.
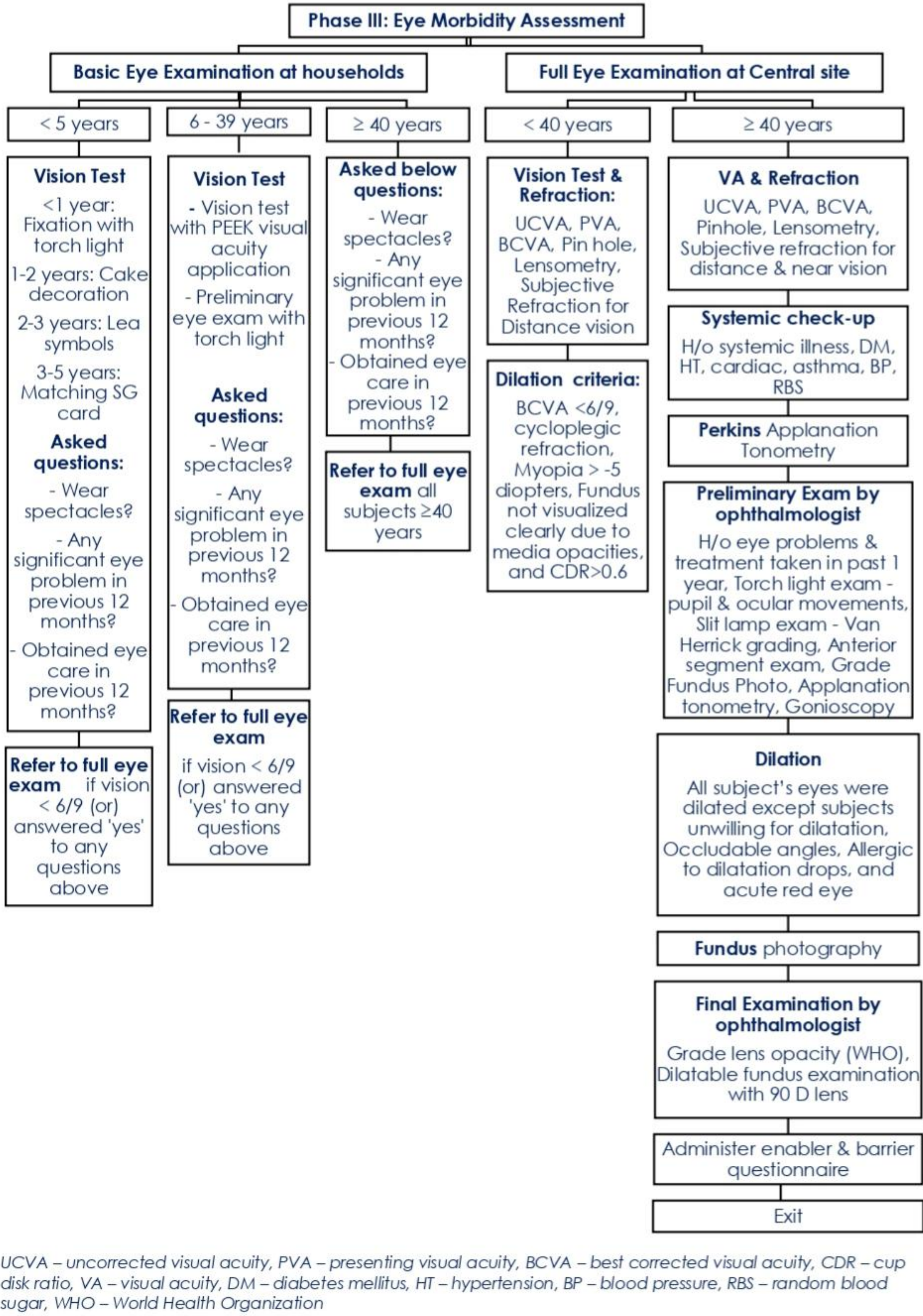

Figure 1: **Study design**

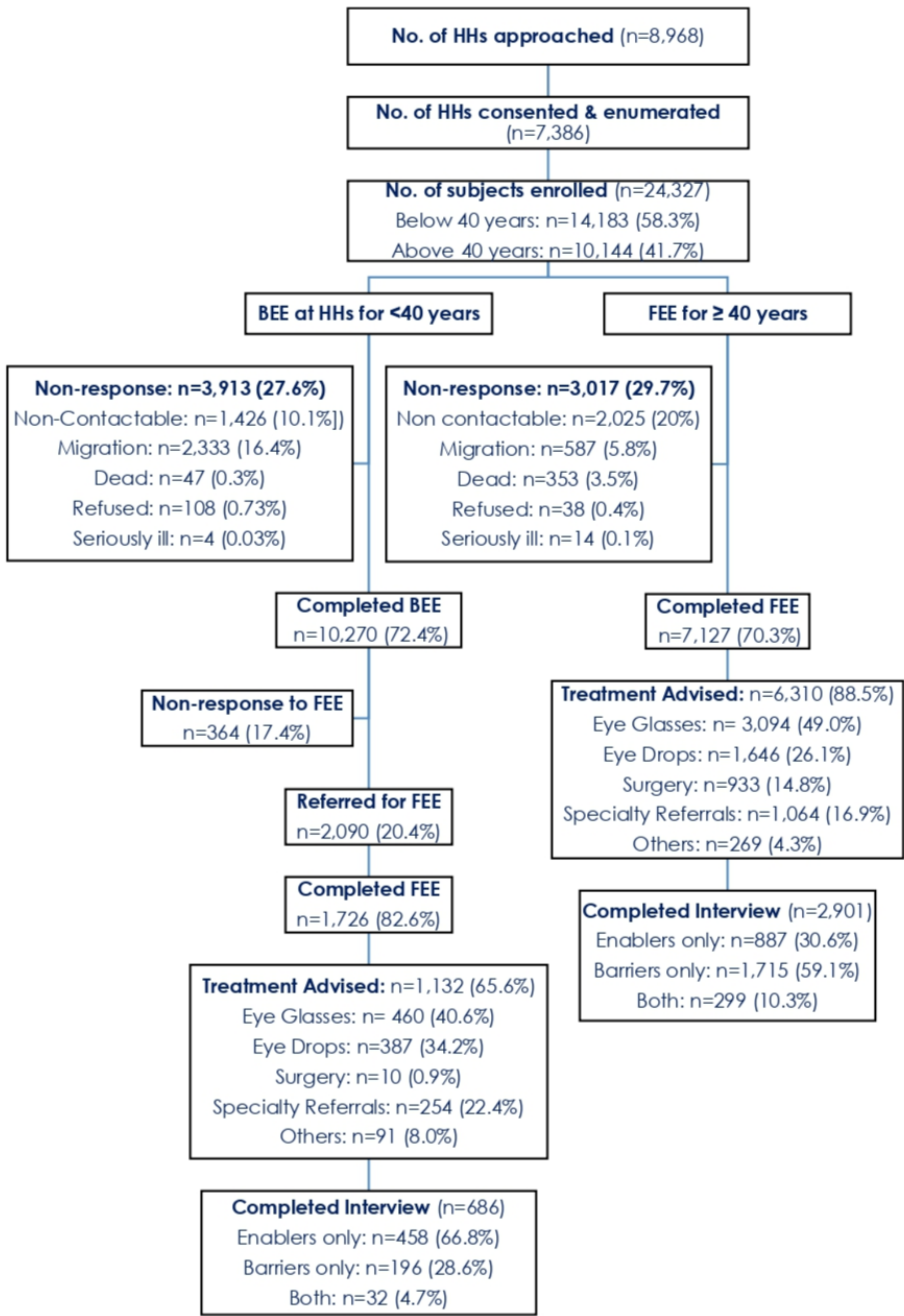|	
Phase – I Baseline enumeration & enrolment	• Cluster mapping • Briefing to households and obtaining consent • Enumeration of all family members • Issuing study identity card for all the family members with "Unique Identification Number" (UIN) for tracking subjects accessing eye care services at Aravind network centers including outreach camps • Issuing an "Eye Health Diary" for each household to document utilization of eye care services
Phase – II: Over 12 months	Live tracking of eye care service usages by the enrolled study subjects
Phase – III Morbidity assessment one-year post-enrollment within study clusters	**Eye Care Service Utilization Assessment** • Capture eye service utilization using "Eye Health Diary" and direct household survey • Administer "eye care service utilization, and enabler & barrier questionnaire" **Eye Morbidity Status Assessment** a) Basic eye examination at households for below 40 years b) Full eye examination (FEE) for ≥ 40 years • Comprehensive eye examination at the field examination site in select clusters • Referral to Aravind eye hospital those meeting the referral criteria.

Examination Details: *(Figure 2)*

- BEE offered to **all individuals aged < 40 years at HH level**
- FEE conducted to:
  – All individuals aged ≥40 years
  – Individuals < 40 if clinically indicated.
- FEE included:
  – Vision testing and subjective refraction
  – Blood glucose, HbA1c, blood pressure measurement,
  – Intraocular pressure and dilated fundus imaging,
  – Comprehensive eye examination
  – **Barriers and enablers** questionnaire.

Results

Figure 2: **Eye morbidity assessment**

UCVA – uncorrected visual acuity, PVA – presenting visual acuity, BCVA – best corrected visual acuity, CDR – cup disk ratio, VA – visual acuity, DM – diabetes mellitus, HT – hypertension, BP – blood pressure, RBS – random blood sugar, WHO – World Health Organization

Figure – 3: **Survey Participants**

HH - household, BEE - basic eye examination, FEE - full eye examination

Conclusion

- This **novel population-based CEWA study** provides a **structured** and **evidence-driven** approach to estimate **annual eye care needs** in a **defined population**.
- Unlike **conventional planning methods** relying solely on **prevalence data**, our framework captures **met, undermet, and unmet needs**— offering a more **realistic picture of service demand**.
- These findings hold **significant value** for **policymakers** and **planners**, enabling better **resource allocation**, **service delivery**, and **long-term strategies** in similar **resource-limited settings**.

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ARAVIND EYE CARE SYSTEM

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