

# Effectiveness of technology for screening children (3-8 years) in resource limited settings: a descriptive study.

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## Introduction

- Each year, over **500,000 children** become blind, with nearly **50% of cases being preventable or treatable**.
- Amblyopia**, the leading cause of monocular vision loss in children, affects **3% of adults** when left untreated.
- The risk is higher in **low- and middle-income countries (LMICs)** due to inconsistent or absent screening programs.
- Scalable, technology-driven vision screening programs** are urgently needed to prevent amblyopia-related vision loss in LMICs.
- While photoscreeners like the Spot Vision Screener have been studied for accuracy, their **effectiveness in real-world community settings remains underexplored**.
- The **aim** was to evaluate an efficient vision screening program to detect preventable vision loss in children in Nepal and linkage to care. A community-based program would have two main benefits: first, the capability to screen pre-school children and second, enhanced communication with parents.

## Methods

**Study Type:** Community-based prospective study (Sept 2023 – Nov 2024).

**Location:** Wards 5, 6, and 13, Bharatpur Municipality, Nepal.

**Participants:** 2091 children (3-8 years).

**Screening Process:**

- Children identified via REDCap database.
- Consent obtained from parents/guardians.
- Screening at schools, community centers (toles), and homes.
- Spot Vision Screener used per AAPOS 2021 guidelines.
- Trained ophthalmic assistants conducted screenings.
- Referral issued for “Complete Eye Exam Recommended” results.
- Torchlight exam performed to detect external abnormalities.
- Follow-up reminders and free transportation facilitated referrals

## Results

**Total eligible children:** 2091

**Total Screened:** 1,731 (82.78% of eligible children)

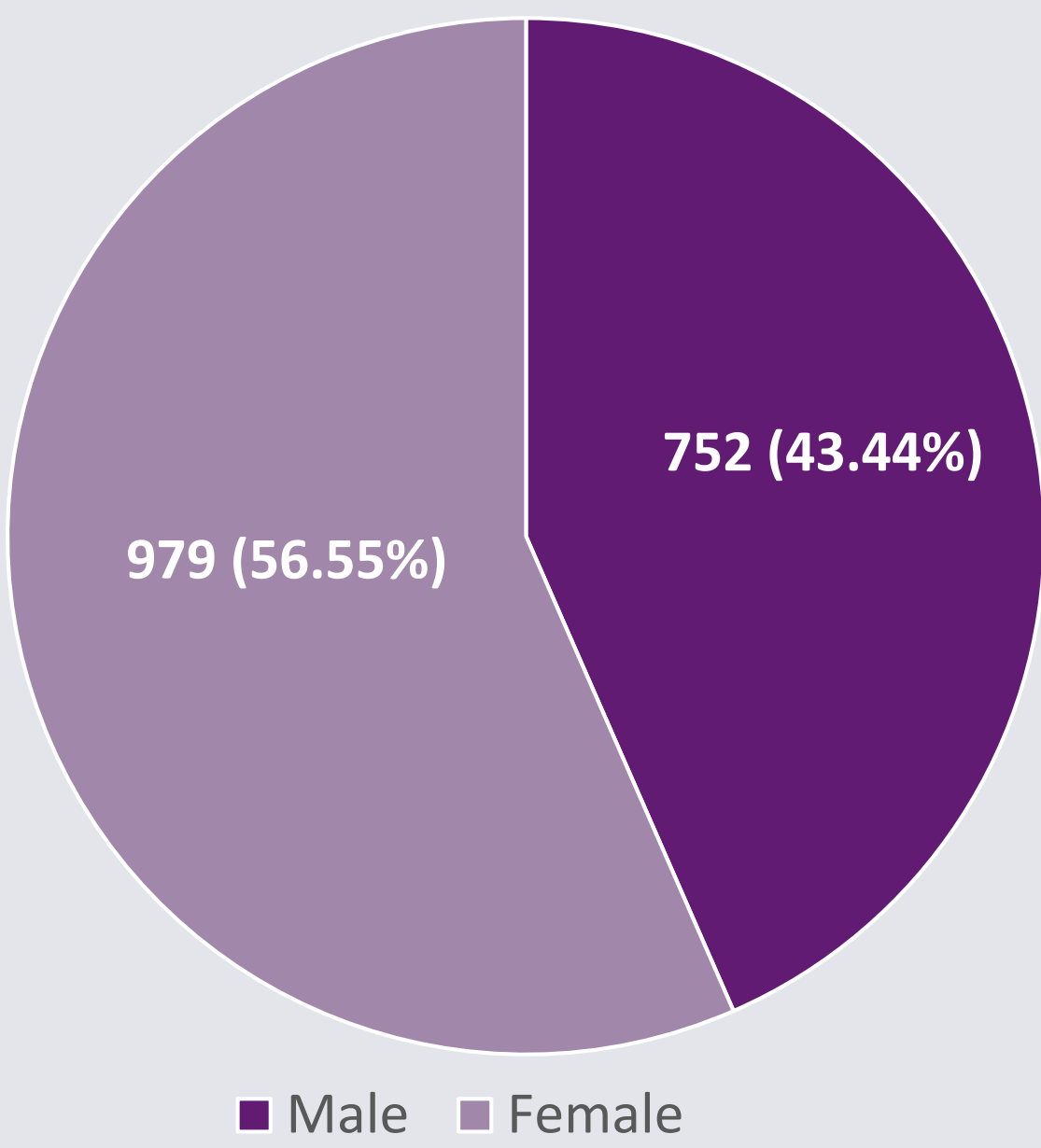
**Referral rate:** 376(21.72%) of children screened were referred based on the screening results from spot screener as per the set referral criteria.

**Attended referral visit:** 317 (84.30%)

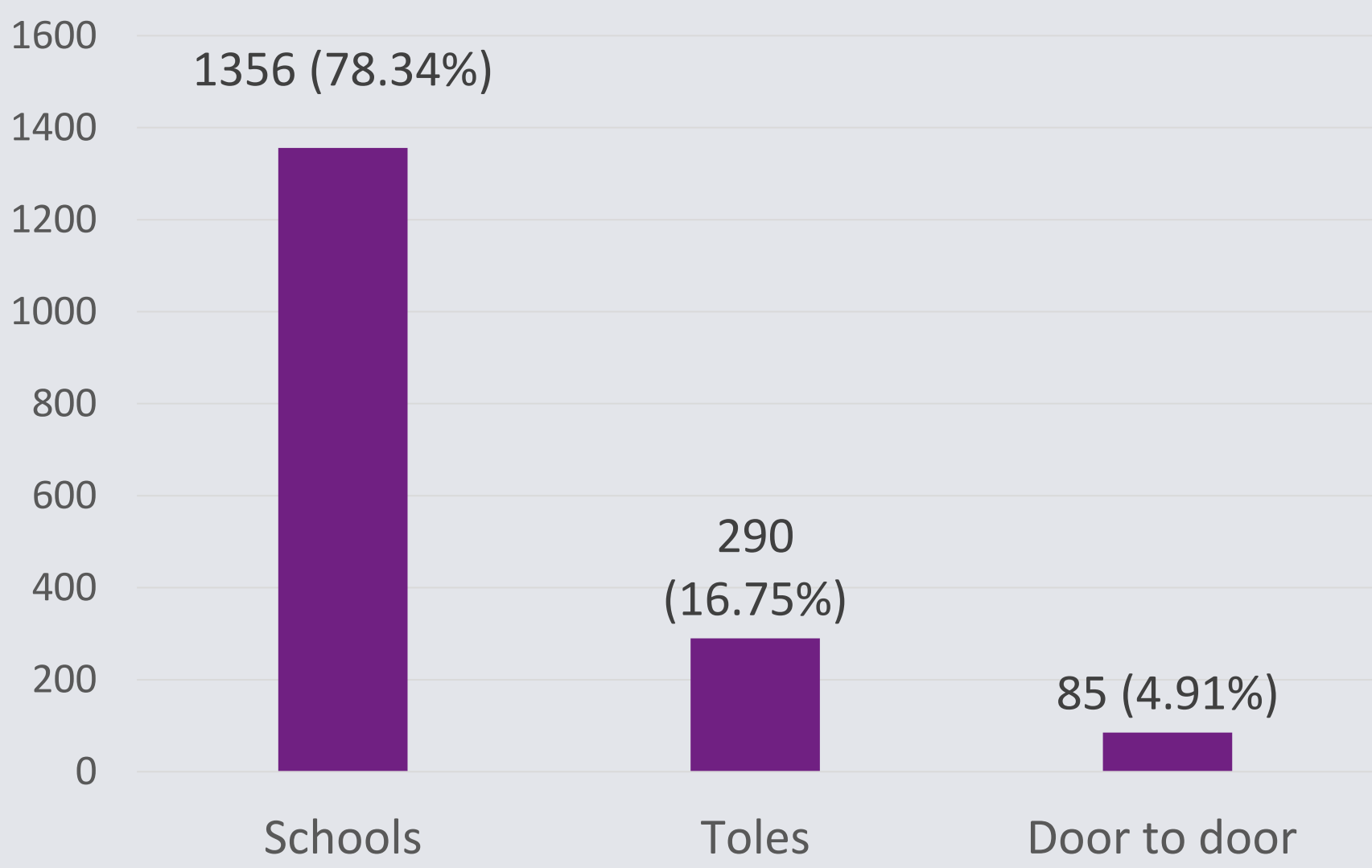
**Linkage to care:** 68 (18.09%)

**Mean age :** 5.95±1.88 years.

Sex distribution



Screening locations



Diagnosis	Number(%)
Significant refractive error	67(21.13%)
Amblyopia	48(15.14%)
Strabismus	39(12.30%)
Other ocular Pathology	11(3.47%)
Normal/insignificant refractive error	152(48%)
Total	317(100%)

- 165(52%)** were diagnosed to have **significant vision problems**.
- Prevalence of significant refractive error:** 3.87%
- Prevalence of amblyopia:** 2.77%
- Prevalence of strabismus:** 2.25%

## Discussion

- The results highlight the utility of this technology as a **viable screening tool** for identifying preventable vision loss and linking children to appropriate eye care services.
- The overall screening coverage of 82.78% (1731 out of 2091 eligible children) was a promising outcome. This reflects the **effectiveness of the community-based screening approach**, which included school-based screenings, as well as targeted door-to-door efforts.
- 21.72% of screened children were referred for further evaluation, which corresponds to a **substantial proportion of children identified** as having potential vision problems.

## Conclusion

- Spot Vision Screener is effective for **early vision screening** in preschool children.
- Can be **integrated into school screening programs** to increase coverage.
- Useful for **resource-limited settings** like Nepal to detect amblyopia and strabismus early.

## Challenges

- Identifying appropriate **research question**
- Getting **ethical approval** from IRB, lengthy and time consuming
- Allocation of **resource and time** for the research
- Translation of research finding** to existing setup to improve eye health