Rapid Assessment of Avoidable Blindness in Alipurduar District in West Bengal, India

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Sightsavers

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Abbreviations

ARMD	Age-related Macular Degeneration
BCVA	Best corrected visual acuity
CI	Confidence Interval
CSC	Cataract Surgical Coverage
DR	Diabetic Retinopathy
EVI	Early visual impairment
FLV	Functional Low Vision
ICEH	International Centre for Eye Health
IOL	Intra-ocular lens
LMIC	Low and Middle-income countries
MSVI	Moderate severe visual impairment
MVI	Moderate visual impairment
NPCB & VI	National Program for Control of Blindness and Visual Impairment
PPS	Proportional Probability to Sample Size
PVA	Presenting visual acuity
RAAB	Rapid Assessment of Avoidable Blindness
SVI	Severe visual impairment
UP	Uttar Pradesh
URE	Unaddressed refractive error
VA	Visual Acuity
VI	Visual impairment
WB	West Bengal
WHO	World Health Organisation

Executive Summary

Visual impairment is a global public health problem. Global vision impairment data suggests that at least 2.2 billion people are estimated to live with a vision impairment (1). Of these, 237 million people are thought to have moderate or severe distance vision impairment in 2020. Out of them about 55% are women and 89% of population live in low and middle income countries. With regard to regional differences, 45% of visual impairment occurs India and China (1). Of the total global population, 40.7% of the global population aged over 50 and having near-vision impairment that could be corrected by glasses. According to National Programme for Control of Blindness and Visual Impairment survey India, 2015-19 (2), there are an estimated of 4.95 million people blind (0.36% of the total population), 35 million people visually impaired (2.55%), and 0.24 million blind children in India (3). Cataract and

refractive error remain the leading cause of blindness and vision impairment respectively in India.

The Rapid Assessment of Avoidable Blindness (RAAB) is a standardised survey methodology, designed to measure the magnitude and causes of visual impairment and the extent to which services are reaching different groups of people. The RAAB focuses on people aged over 50 years because the majority of blindness and visual impairment is found in this age group. With support from Azim Premji Philanthropic Initiatives, Sightsavers is strengthening eye care services in the Alipurduar district of West Bengal State in Eastern India. The objective of the five-year project was to contribute to the elimination of avoidable blindness in the area. In August, 2021we conducted a RAAB in Alipurduar district of West Bengal to assess the prevalence and causes of blindness and visual impairment. We recruited 3,450 individuals aged 50 years and above, of whom 3,380 were examined (98% response rate). After adjusting age and sex the prevalence of blindness was 1.4 per cent (measured as presenting visual acuity in the better eye). The prevalence of blindness among female was 1.7 per cent in comparison to their male counter parts (1.1 per cent).The study also depicts age-specific differentials in reporting of any VI in Alipurduar meaning people in higher age groups have more visual related complications, which is common over the globe. A study done in south India (Nirmalan, et. Al., 2003) also found that surgical coverage for cataract was lower among females than males. The main cause of blindness and severe visual impairment was untreated cataracts (80.9%). In the Alipurduar district, the prevalence of blindness was comparatively lower than the national and state prevalence. Similarly, the prevalence of SVI, MVI, and VI were also low in the studied district. Cataract surgical coverage among blind people was 90.1 per cent (94.5% among males and 87% among females).About effective cataract surgical coverage (VA<6/18) was in total 57.4 per cent; 55.9 per cent among males and 58.6 per cent among females. In terms of surgical outcomes, 78 per cent of all operated eyes had good vision (75% Males and 80% females).

The result of the study indicates that overall prevalence of blindness is almost at par with the average value for the state, there needs to be consistent focus on this district while planning the state level services. Considering the remote location of the district, it would need considerably higher resources to tackle the same level of the problem compared to that planned for the other more accessible regions. Clear indications of gender inequity with females disadvantaged across the blindness and visual impairment spectrum highlight the need for gender responsive programming at all levels. Cataract remains the most significant component of the problem at all levels especially for women. This indicates sustained emphasis on strengthening cataract services at all levels for both demand and supply of the same. Focused planning at policy level and programme level may reduce the percentage of some of the key indicators and improves the situation during endline study.

Introduction

The World Health Organisation (WHO) estimates that globally around2.2 billion people live with some form of visual impairment (a near or distance visual impairment), of whom near about half (1 billion) have vision impairment which is yet to be addressed. This 1 billion people includes those with moderate or severe distance vision impairment or blindness due to unaddressed refractive error (88.4 million), cataract (94 million), glaucoma (7.7 million), corneal opacities (4.2 million), diabetic retinopathy (3.9 million), and trachoma (2 million), as well as near vision impairment caused by unaddressed presbyopia (826 million). About 80% of all visual impairment is considered avoidable. The main causes are uncorrected refractive errors and cataract, which if not diagnosed in a timely manner, can lead to blindness. Most people with visual impairment live in low- and middle-income countries (LMICs) and are over the age of 50 years. In fact, cataract is also said to be the biggest cause behind what is called avoidable blindness. Globally too, cataract is the single most important cause of blindness, and the second most common cause of moderate and severe vision impairment (MSVI). According to he Vision Atlas India There were an estimated 270 million people with vision loss and of those cases 9.2 million were blind (4). Global estimates suggest that the prevalence of visual impairment will increase over the years due to population growth and aging.

India was the first country in the world to launch the National Program for Control of Blindness in 1976 with the goal of reducing blindness prevalence to 0.3% by the year 2020. In 1999, the WHO launched Vision 2020: The Right to Sight, a joint endeavour with IAPB, to eliminate avoidable blindness by 2020 (5). In 2013, World Health Assembly adopted Universal Eye Health: Global Action Plan 2014-19 with an aim to reduce prevalence of avoidable visual impairment by 25% by 2019 compared to the baseline prevalence at 2010. India has implemented a series of measures in its ongoing National Program for Control of Blindness and Visual Impairment (NPCB&VI) to combat blindness and visual impairment.

In India, the recent RAAB was conducted between September 2015-June 2018, among 50+ population, across 31 districts from 24 States/ Union territories. In addition, another survey among 0-49 age group was conducted in six districts between Jan-Feb 2019. Both these surveys conducted by Government of India, were primarily used to estimate the prevalence of blindness and visual impairment in India across all age groups.

The estimated prevalence of blindness among 50+ (N=85135) was 1.99%, 1.96% severe visual impairment (SVI), 9.81% moderate visual impairment, and 12.92% early visual impairment (EVI) and 11.77% moderate severe visual impairment (MSVI). National blindness prevalence was high among 80+ population (11.6%), illiterates (3.23%), rural (2.14%) than their respective counterparts. Further the survey reported cataract as the principal cause of blindness with 66.2%, 80.7% of SVI and 70.2% of MVI (NPCB-MoHFW-GoI, 2020).

Cataract Surgical Coverage (CSC) among ≥50 years, was 93.2% with Visual Acuity (VA) < 3/60 and 74% with VA < 6/18. There is a decreasing trend of blindness with 5.3% in 2001, 3.6% in 2007 and 1.99% in 2019. Economic reasons (22%) are cited as the most common barrier for cataract surgery (NPCB-MoHFW-GoI, 2020). Bijnor district of Uttar Pradesh (UP), was recorded with highest prevalence of blindness and VI in the country at 3.67%. In addition to Bijnor, two other districts, Ambedkar Nagar (2.57%) and Banda (2.18%) were reported with higher than overall national blindness prevalence. (NPCB-MoHFW-GoI, 2020).

Scientific rationale for current survey

The National Blindness and Visual Impairment Survey was completed in 2018, in selected 31 districts of India. We conducted RAAB surveys in Alipurduar West Bengal (WB) to inform the State government and to plan and implement comprehensive universal eye health services for these specific districts. Additionally, the data will serve as a baseline measure of eye health status and service coverage that can be replicated after several years to evaluate any change or progress. This project fits within the priorities of the national programme as well as those of its partner, Sightsavers.

This report describes the results of a RAAB survey, which assessed the magnitude and causes of visual impairment in Alipurduar district, West Bengal, India.

Methodology

Survey setting

Alipurduar is one of the districts in the Eastern side of India, in the state of West Bengal. Alipurduar was formerly part of the district, Jalpaiguri and it was created into a separate district in 2014. The district consists of one Municipality (urban) and six community development blocks (rural): Madhirat-Birpara, Alipurduar-I, Alipurduar-II, Falakata, Kalchini and Kumargram. The district has an area of 3136 sq.km, with 327 villages and a sex ratio of 948/1000.As per 2011 census, the total population size was 15,01,983 and a literacy of about 64.7% (Census, 2011) (6). Eighty percent of the population belong to marginalised populations like scheduled caste and scheduled tribe community. (Government of West Bengal, 2021)

Location of study clusters: Alipurduar district

Study design

This RAAB is a descriptive, cross-sectional population-based study to estimate the prevalence of blindness and visual impairment in above 50 years age group. The study used the standard RAAB (V. 6) survey methodology as outlined in the RAAB 6 manual (7).

Study objectives

The main aim of this study is to generate key epidemiological evidence to inform the eye health planning and provide baseline data for the interventions by Sightsavers and State governments.

Objective

To estimate the prevalence and causes of blindness and visual impairment among people aged 50 years and above in West Bengal (Alipurduar), India.

Specific objectives

- To determine the prevalence of blindness and visual impairment (including avoidable blindness)
- To identify the major causes of blindness and visual impairment (including avoidable blindness) in India
- To estimate the cataract surgical coverage in India in 50+ population
- To ascertain the visual outcomes after cataract surgery in 50+ population
- To ascertain barriers for uptake of cataract surgery in 50+ population

Study areas and sample selection

The study population included people aged 50 years and over, who were ordinarily residents in the studied district defined as living in the selected households for six or more months over the past year and sharing meals from the same kitchen. Participants who were not residents were unable to provide meaningful consent or refused to participate were excluded from the study.

Sample size

Based on the 2019 India RAAB, the expected prevalence of blindness in adults aged over 50 years in West Bengal is conservatively estimated at around 1.54%. Allowing for a confidence of 90%, a precision of 5% (i.e worst acceptable result of 20%), with a design effect of 1.5 for clusters of 50, and 10% non-response the required sample size was 3,500, people aged 50 and above. (RAAB 6 software). Clusters of size 50 were chosen due to dispersed villages in the study area and long travel distances. In total 70 clusters of 50 adults aged ≥50 years were required for this survey.

Sampling procedure

Two-stage sampling procedure was used for the survey. Primary sampling units (PPU), villages, was selected at random from a complete list using probability proportionate to size (PPS) methodology. A list of all villages in Alipurduar district with their populations were obtained and verified at State/ District government department. The complete list of the villages was uploaded to the RAAB software, which has an inbuilt probability proportionate to size selection tool.

Within each selected village, 50 eligible participants were enrolled in the study. A cluster informer visited the listed village a few days before the team arrives and work with the village leaders in order to identify the border of the village. A map was developed with the help of the village leader to segregate the villages into smaller segments in cases where the population size is large, exceeding 500 inhabitants. Further, a segment was chosen at random by numbering them and choosing a number at random.

Once the village/segment boundaries are clear, the cluster informer informed the study team and provided them with a copy of the map. All households in the selected segments were visited and all eligible people living there, whether present that day or not, were enumerated. Households were visited sequentially, and people enumerated, until 50 people aged 50+ years were recruited. All participants present during the visit who consented to participating in the survey, underwent a standardised eye examination including visual acuity screening. and the team attempted to revisit the house at the end of the day to capture anyone missing at the time of the first visit. Basic data about participants unavailable for the visual acuity screening were collected from their family members or neighbours. Later the team proceed to the next nearest village until 50 people have been enumerated.

Data collection and management

Five teams collected the data; each team comprised of an ophthalmologist or experienced ophthalmic technician as an examiner, two optometrists, a community health worker and a driver. At each village, a local guide from the community development partner joined the team to guide them and make household introductions. Teams underwent a four-day training with certified RAAB trainers, and all passed an IOV exam to show standardization of clinical examination.

In a selected area, the team moved from the edge of the selected segment closest to the main road, to the nearest house, and continued systematically until 50 people aged 50 years + have been enumerated and examined. If an individual was absent at the time of the visit they were enumerated, and the house was revisited at the end of the day to carry out the examination. If they were still absent information on their visual status was collected from their family or neighbor but not included in the analysis.

Prior to examination, the information regarding survey was provided to the participants and consent was sought from each individual and the head of the household. All consenting participants underwent ophthalmic examination in their homes, including measurement of visual acuity (VA) in daylight with a tumbling-E chart, lens examination with a direct ophthalmoscope in a darkened house. People dilation was only used if judged necessary by the examiner. For every individual examined the data collected

was stored within the mRAAB app which was on an android phone; the study used keyless, touch-screen, mobile devices (encrypted and password protected mobile units).

Data analysis

The study tools were designed into one app using mRAAB software. Data were downloaded and stored in .csv format and uploaded to the RAAB v6 software for analysis.Results were tabulated, calculating sample prevalence point estimates for each indicator of interest, and 95% confidence intervals surrounding them were estimated. Standard errors were adjusted for clustering using the design effect observed. The age and sex distributions of the sample were reviewed against available census data and a weighting file was developed and used to create age and sex adjusted estimates and confidence intervals of each key indicator.

Ethical considerations

This study was conducted in line with the highest standard of ethical conduct. Participants were given information about the study and provided with an opportunity to ask questions. It was stressed that participation was entirely voluntary, and a verbal consent was taken before proceeding with the survey examination. Participants examined and found to have ocular morbidities were asked for permission to share their name with clinical implementation partnerto ensure they would be transported to the base Hospital at the next available time.

Ethical clearance was obtained from IR board of Vivekananda Mission Hospital prior to the study.

Results

Description of the sample

The data was collected during August 2021in the selected district. During the data collection, a total of 3450 participants aged 50 years or older were recruited of whom 3380 were examined (98.0% response rate) (Table 1) with around 51% of male and 49% of female participants. Of those who could not be examined, majority (39) were unable to do so due to severe physical or intellectual disability..

Table 1 Examination status of enrolled participants

	Males		Females		Total
	N	%	N	%	N
Examined	1,710	50.6%	1,670	49.4%	3,380
Not available	11	64.7%	6	35.3%	17
Refused	10	71.4%	4	28.6%	14
Not capable	10	25.6%	29	74.4%	39
Total	1,741		1,709		3,450

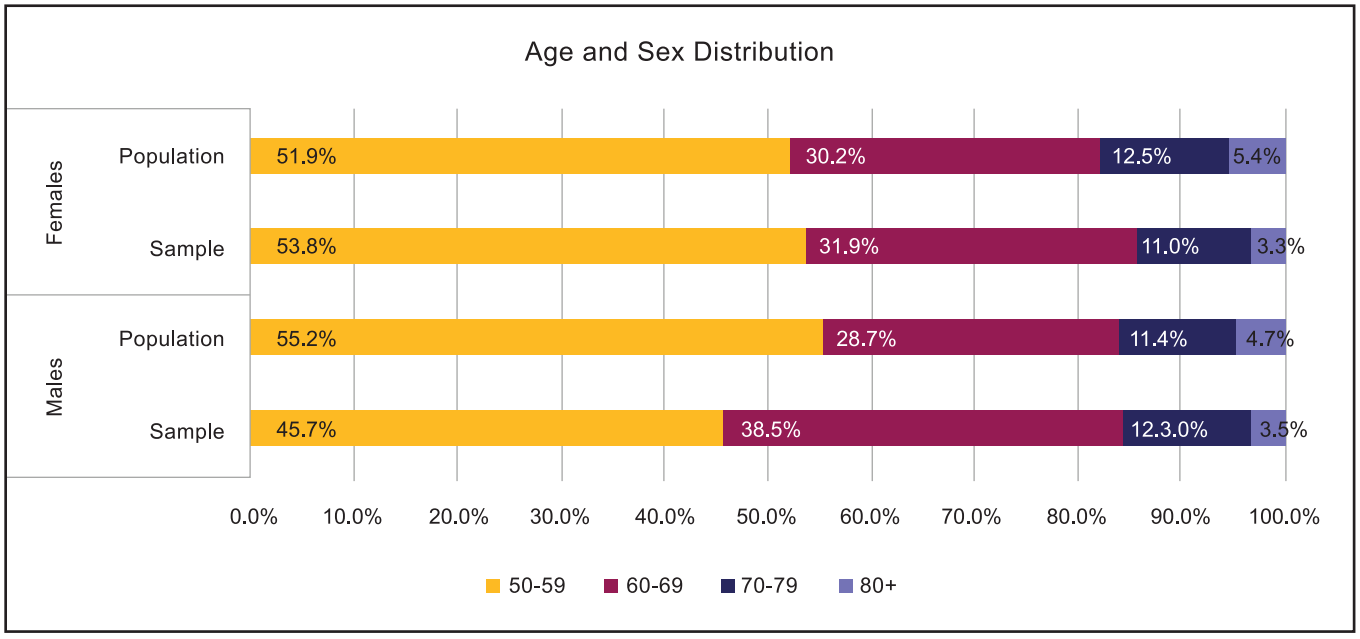
Near about half of the total surveyed sample were aged 50-59 years and more females (53.8%) than males (45.7%) were examined during the survey in this age group (Table 2). However, 35.2% of the sample were in 60-69 years age group, 11.7% were in the age group 70-79 years and 3.4% belong to the age group 80 years and above with almost a similar distribution by sex.

Table 2 Age and sex distribution of examined individuals

	Males		Females		Total	
	n	%	n	%	n	%
50 - 59	781	45.7%	899	53.8%	1680	49.7%
60 – 69	659	38.5%	532	31.9%	1191	35.2%
70 – 79	211	12.3%	184	11.0%	395	11.7%
80+	59	3.5%	55	3.3%	114	3.4%
Total	1710		1670		3380	

Compared to the population of people aged 50 years and older living in the district, males were slightly under-represented in the study sample (53.3% compared to 45.7% in the population). The age distribution of the sample also indicated under-representation of males in the 50-59 years age group (45.7% in sample compared to 55.2% in the population) (Figure 1). To address the potential bias arising from the sampling, estimates for the prevalence of blindness and visual impairment were adjusted (weighted) for sex and age.

Figure 1 Comparison of study sample and area population



Prevalence and causes of visual impairment

The prevalence of blindness in our sample was 1.4% (95% CI 1.0-1.8) (Table 3), while the adjusted prevalence of blindness was 1.5% (95% CI 1.1-1.9) (Table 3.1). The prevalence of blindness was found to be higher among women (2.1%, 95% CI 1.4 – 2.7) compared to men (1.1%, 95% CI 0.6 – 1.5) but the difference was not statistically significant.

The adjusted prevalence of severe visual impairment (SVI) was 1.8% (1.5% for men and 2.1% for women) and the adjusted prevalence of moderate visual impairment (MVI) was 6.6% (6.4% for men and 6.9% for women).

PREVALENCE

Prevalence is the proportion of persons in a population who have a particular disease or attribute (new and old) at a specified point in time.

Prevalence of Blindness – proportion of people who are blind due to any cause in the population at the time of the survey

Table 3.1 Sample prevalence of blindness, SVI, MVI and FLV – all cause

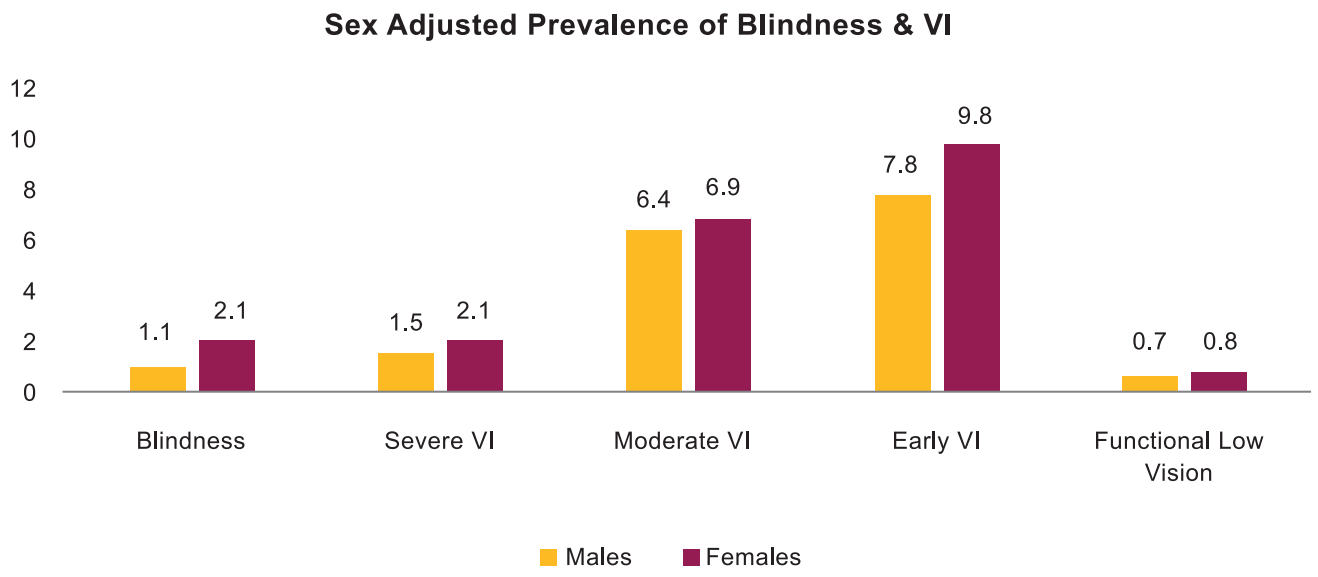
	Males			Females			Total		
	N	%	(95% CI)	n	%	(95% CI)	n	%	(95% CI)
Blindness	18	**1.1**	(0.6-1.5)	29	**1.7**	(1.1-2.4)	47	**1.4**	(1.0-1.8)
Severe VI	26	1.5	(0.9-2.2)	31	1.9	(0.9-2.8)	57	1.7	(1.1-2.3)
Moderate VI	111	6.5	(5.2-7.8)	111	6.7	(5.5-7.8)	222	6.6	(5.7-7.5)
Early VI	144	8.4	(6.9-9.9)	161	9.6	(8.0-11.3)	305	9	(7.7-10.3)
Functional Low Vision	11	0.6	(0.3-1.0)	14	0.8	(0.4-1.3)	25	0.7	(0.5-1.0)

Table 3.2 Adjusted prevalence of blindness, SVI, MVI and FLV (adjusted) – all cause

	Males			Females			Total		
	n	%	(95% CI)	n	%	(95% CI)	n	%	(95% CI)
Blindness	1,399	1.1	(0.6-1.5)	2,414	2.1	(1.4-2.7)	3,814	**1.5**	(1.1-1.9)
Severe VI	1,966	1.5	(0.8-2.1)	2,441	2.1	(1.2-3.0)	4,409	**1.8**	(1.2-2.3)
Moderate VI	8,471	6.4	(5.1-7.7)	8,069	6.9	(5.8-8.0)	16,551	**6.6**	(5.7-7.5)
Early VI	10,434	7.8	(6.3-9.3)	11,407	9.8	(8.1-11.4)	21,850	**8.7**	(7.4-10.0)
Functional Low Vision	915	0.7	(0.3-1.0)	971	0.8	(0.4-1.3)	1,886	**0.8**	(0.5-1.0)

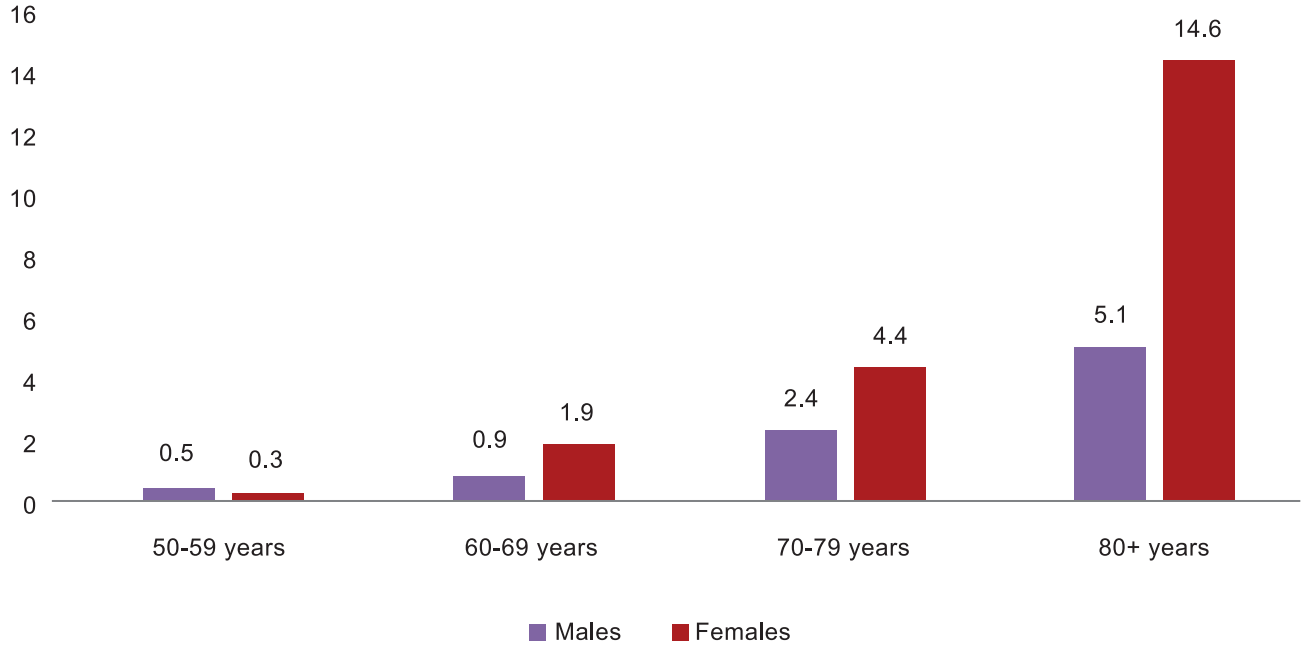
The figure below (figure 2) shows the adjusted prevalence of blindness, SVI, MVI and FLV by age and sex. The graph clearly shows that females are more prone to have any visual impairments compared to the male counterpart in the surveyed district. This could be possibly due to the late detection and negligence of any health concerns by the females until serious which is very much common in Indian society.

Figure 2 Age & Sex adjusted prevalence of blindness, SVI, MVI and FLV



The below mentioned figure (figure 3) clearly shows that age is one of the major factor of prevalence of blindness in the studied district. Females in the higher age group (80+ years) were reported more than twice of having blindness compared to the male counterpart representing more vulnerability in that particular area.

Figure 3 Age & Sex adjusted prevalence of blindness (PVA<3/60 in better eye)



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Causes of Blindness and Visual Impairment

The principal cause of bilateral blindness (80.9% of cases) was untreated cataract (Table 4) Cataract surgical complications and non-trachomatous corneal opacities were the second most common causes (both 6.4%). Untreated cataract was also the leading cause of severe VI (96.5%) and moderate VI (73.4%).

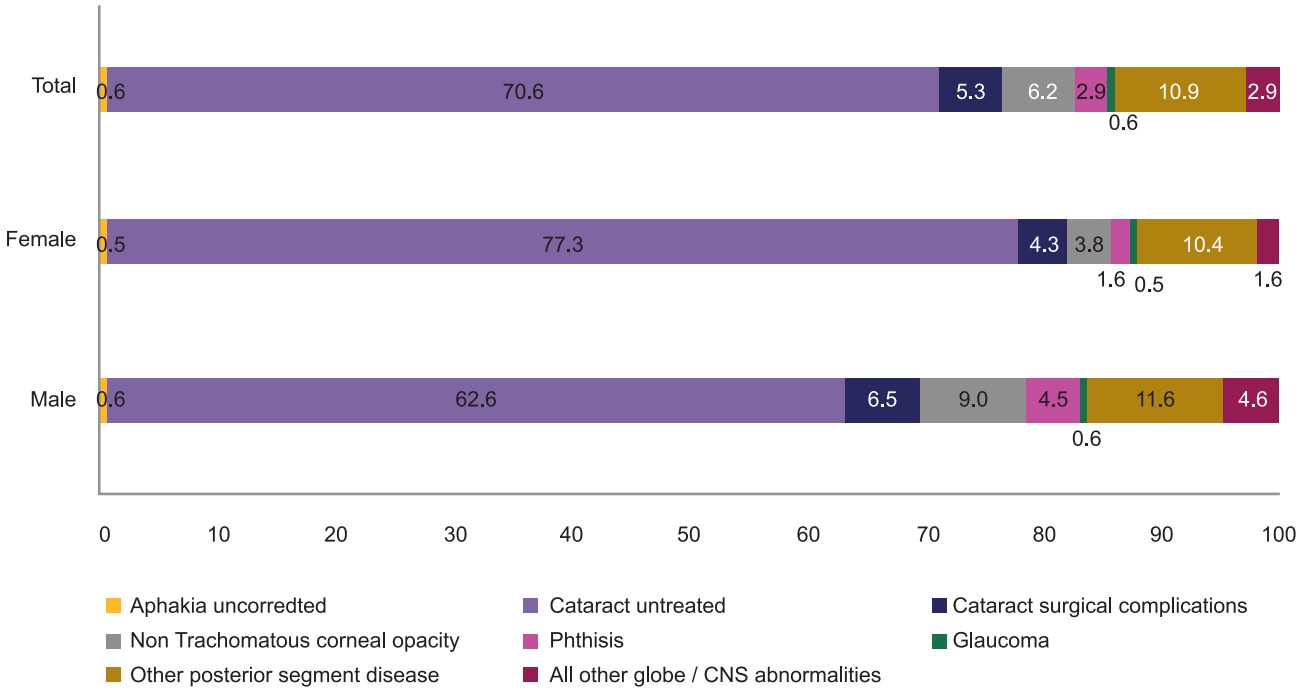
Since detailed posterior segment examination could not be done (due to COVID-19 restrictions on direct ophthalmoscopy) 'assumed' posterior segment causes such as Glaucoma, AMD and DR had to be clubbed together and were collectively responsible for another 6.4% of blindness and 6.3% of Moderate VI. This is also acknowledged as a limitation of the study and needs to be considered while assessing the implications of the results on the project.

Table 4 Main causes of visual impairment

	Blindness		Severe VI		Moderate VI		Early VI	
	n	%	N	%	n	%	n	%
Cataract untreated	38	80.9%	55	96.5%	163	73.4%	60	19.70%
Refractive error	0	0.0%	0	0.0%	34	15.3%	235	77.00%
***Other posterior Segment**	3	6.4%	2	3.5%	14	6.3%	3	1.00%
Cataract surgical Complications	3	6.4%	0	0.0%	5	2.3%	0	0.00%
Pterygium	0	0.0%	0	0.0%	2	0.9%	2	0.70%
Whole Globe/ CNS	0	0.0%	0	0.0%	2	0.9%	1	0.30%
Non-Trachomatous CO	3	6.4%	0	0.0%	1	0.5%	0	0.00%
Diabetic retinopathy	0	0.0%	0	0.0%	1	0.5%	2	0.70%
Aphakia uncorrected	0	0.0%	0	0.0%	0	0.0%	0	0.00%
Phthisis	0	0.0%	0	0.0%	0	0.0%	0	0.00%
Myopic Degeneration	0	0.0%	0	0.0%	0	0.0%	0	0.00%
Glaucoma#	0	0.0%	0	0.0%	0	0.0%	0	0.00%
ARMD	0	0.0%	0	0.0%	0	0.0%	2	0.70%
Total	47	100.0%	57	100.0%	222	100.0%	305	100.00%

Figure 4 shows the principal cause of blindness among examined males and females. Cataract untreated was the principal cause of blindness for both male and female. Followed by other posterior segment diseases* (10.9%) with a minor male-female difference. Cataract surgical complications was responsible for around 6.5% of the blindness amongst male participants compared to 4.3% among female participants. Other posterior segment disease and Non-Trachomatous corneal opacity caused blindness in 10.9% and 6.2% of the participants respectively and mostly male .

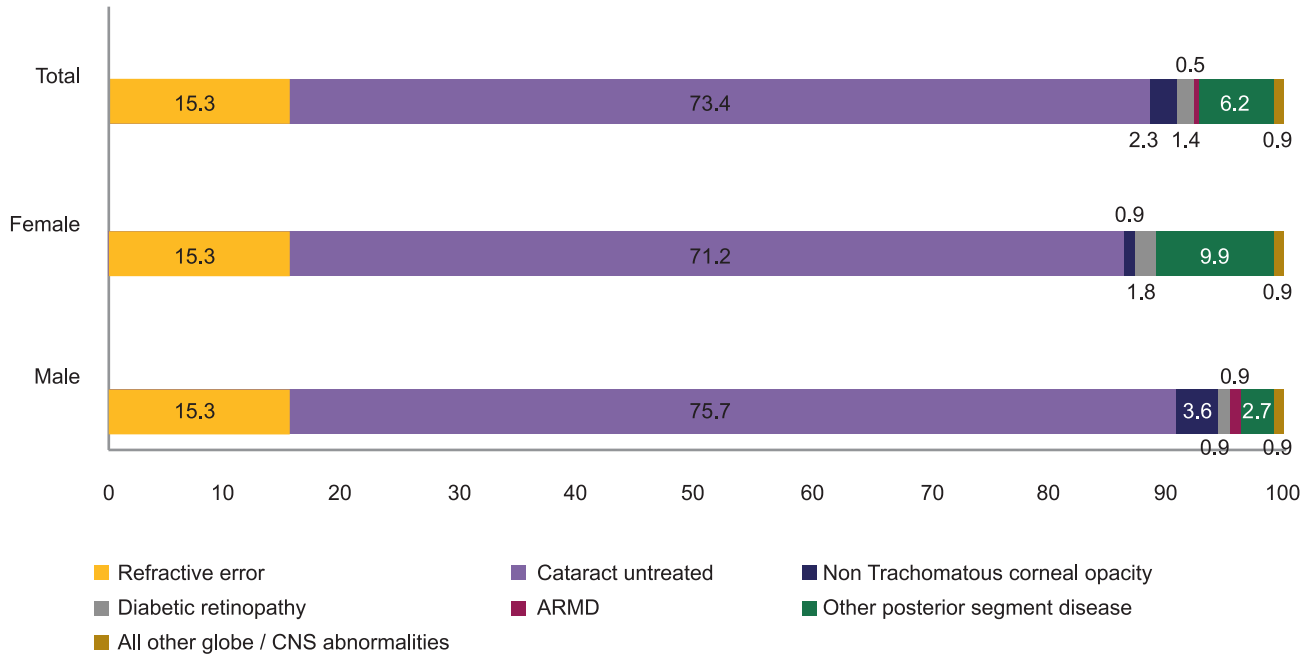
Figure 4 Principal causes of blindness among examined males and females



Cataract Untreated was found as the principal cause of severe visual impairment in persons with VA<6/60 – 3/60 with available correction , especially among males (100%). However, 93.5% of the females had cataract untreated along with other posterior segment diseases (6.5%) as causes of severe VA.

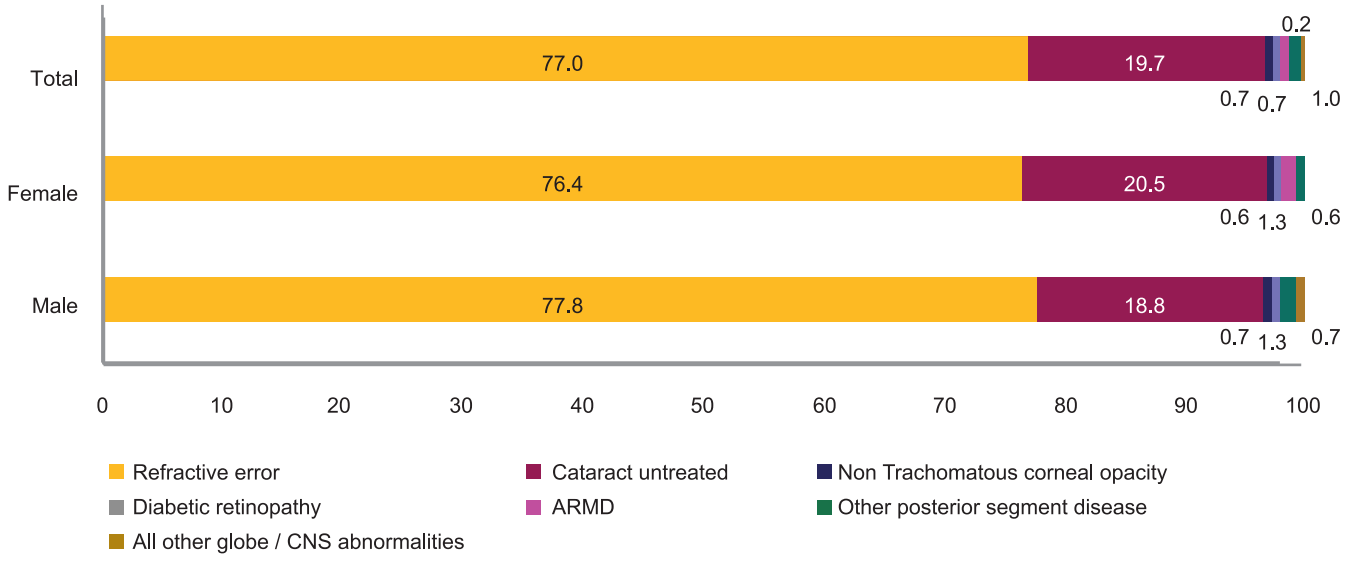
Cataract untreated was the principal cause of moderate VI among examined male and females with around four percentage-point gender difference (75.7% male vs. 71.2% female). While unaddressed refractive error was the second highest identified cause of MVI (15.3%) amongst both male and female participants. Followed by other posterior segment diseases (overall 6.2%) with 9.9% female and 2.7% male examines. Only in about 2.3% Cataract surgical complications was the cause of MVI (3.6% male vs. 0.9% female).

Figure 5 Principal causes of moderate visual impairment among examined males and females



Unaddressed refractive error was the main principal cause of bilateral EVI (235; 77.0%) (Figure 5), followed by untreated cataract (60; 19.7%). Other, less significant principal causes included other posterior segment diseases (8; 1.0%), Diabetic retinopathy (2; 0.7%), and globe or CNS abnormalities (1; 0.2%).

Figure 6 Principal causes of early visual impairment among examined males and females



Cataract

The table below shows the adjusted prevalence of bilateral cataracts with VA<3/60, VA<6/60, and VA<6/18. The adjusted prevalence of bilateral blindness due to cataract (amongst 50+ age group) was 0.7% (95% CI 0.4-0.9); whereas SVI and MVI due to cataract was 0.5 (95% CI 0.3 - 0.7) and 3.3% (95% CI 0.8 - 1.4) respectively. There was a significantly higher prevalence of Blindness due to Untreated cataract amongst women (1.1%) as compared to men (0.3%).

Table 5 Prevalence of bilateral cataracts with VA<3/60, VA<6/60, and VA<6/18 (adjusted)

		Males			Females			Total		
		n	%	(95% CI)	N	%	(95% CI)	n	%	(95% CI)
Cataract and VA<3/60 with best correction or pinhole	Bilateral cataract	351	0.3	(0.0 - 0.5)	1,313	**1.1**	**(0.6 - 1.6)**	1,664	**0.7**	(0.4 - 0.9)
	Unilateral cataract	4,692	3.5	(2.7 - 4.3)	6,487	**5.6**	**(4.4 - 6.7)**	11,179	4.5	(3.7 - 5.2)
	Cataract eyes	5,395	2.0	(1.5 - 2.6)	9,114	**3.9**	**(3.1 - 4.8)**	**14,509**	2.9	(2.3 - 3.5)
Cataract and SVI - VA<6/60 - 3/60 in better eye with best correction or pinhole	Bilateral cataract	390	0.3	(0.0 - 0.6)	909	0.8	(0.4 - 1.2)	1,299	**0.5**	(0.3 - 0.7)
	Unilateral cataract	1,767	1.3	(0.8 - 1.8)	982	0.8	(0.5 - 1.2)	2,749	1.1	(0.8 - 1.4)
	Cataract eyes	2,549	1.0	(0.6 - 1.3)	2,802	1.2	(0.8 - 1.6)	**5,351**	1.1	(0.8 - 1.4)
Cataract and Moderate VI (MVI) - VA<6/18 - 6/60 in better eye with best correction or pinhole	Bilateral cataract	4,404	3.3	(2.3 - 4.3)	3,948	3.4	(2.3 - 4.4)	8,352	**3.3**	(2.6 - 4.1)
	Unilateral cataract	3,570	2.7	(1.9 - 3.5)	3,035	2.6	(2.0 - 3.2)	6,605	2.6	(2.1 - 3.1)
	Cataract eyes	12,376	4.6	(3.7 - 5.6)	10,930	4.7	(3.7 - 5.6)	**23,306**	4.7	(3.9 - 5.4)

The graph below shows the adjusted results for distribution of various levels of visual impairments in the sample population. A total of 1,664 bilateral blindness, 1,299 severely visually impaired; 8,352 moderately visually impaired, and 10,028 persons had early visually impaired persons across the studied group.

Figure 7 Adjusted results for cataract and VA<3/60, <6/60, < 6/18 and <6/12 with best correction

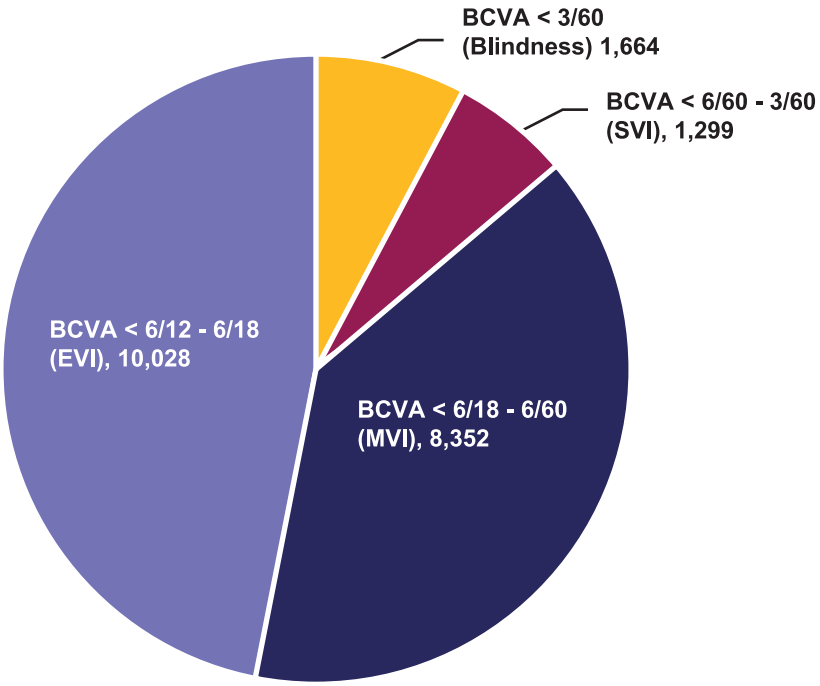
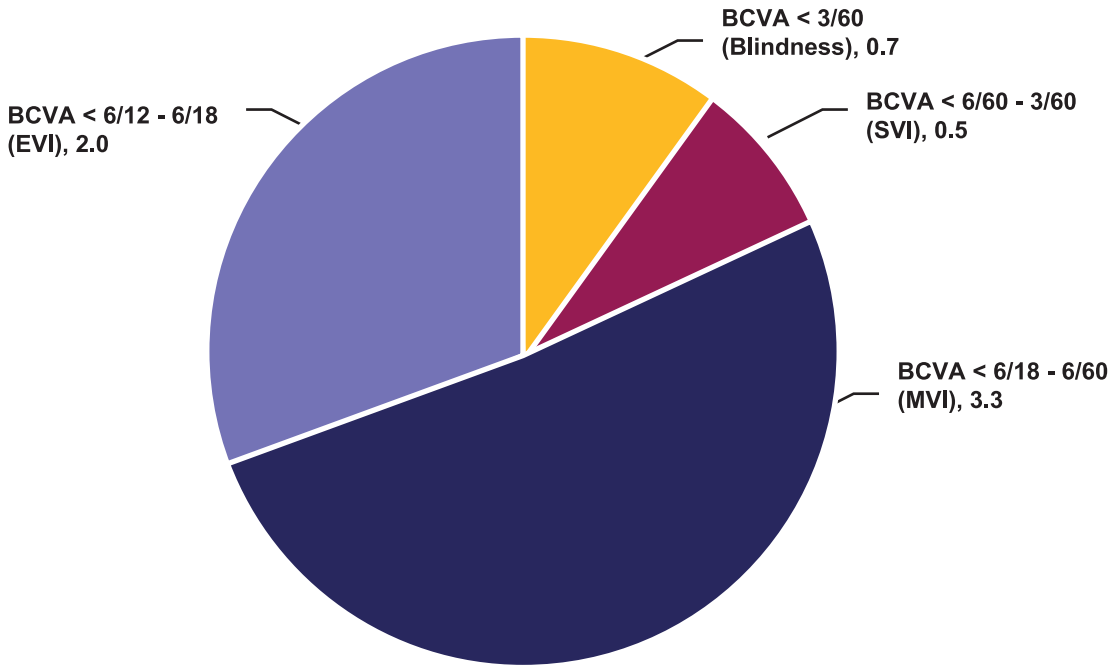


Figure 8 shows that around 0.7% of people aged 50+ years in Alipurduar are bilaterally blind due to cataract and another 0.5% are SVI. 3.3% and 2.0% of persons have MVI and EVI due to cataract in the studies district respectively.

Figure 8 Adjusted results for cataract and blindness, SVI, MVI and EVI (best corrected)



Cataract surgery

Cataract surgical coverage (CSC) measures the proportion of cataracts that have been operated on out of all operable cataracts. It is an indicator of the equity of service utilization with respect to the community need for cataract services. CSC (persons) in our sample was 89.8%at VA<3/60; the coverage was higher among men compared to women (94.6% vs 86.6%) (Table 6).

Table 6 Cataract surgical coverage (persons)

Cataract Surgical Coverage (persons) – percentage			
	Males	Females	Total
VA < 3/60	94.6	86.6	89.8
VA < 6/60	90.1	79.7	83.9
VA < 6/18	59.2	61.5	60.5

Table 7 shows that a total of 486 eyes operated for cataract 379 (78.0%) with a very good presenting vision (VA≥6/12); another ~8.0% of eyes had a good presenting vision (6/12>VA ≥ 6/18); 6.2% had borderline vision (6/18>VA≥6/60); and 38 eyes (7.8%) had poor vision (VA<6/60).

Table 7 Visual outcomes with available correction by type of surgery (eyes)

	Non-IOL		IOL		Total	
	Eyes	%	Eyes	%	Eyes	%
Very good: can see 6/12	1	20.0	378	78.6	379	78.0
Good: can see 6/18	0	0.0	39	8.1	39	8.0
Borderline: can see 6/60	1	20.0	29	6.0	30	6.2
Poor: cannot see 6/60	3	60.0	35	7.3	38	7.8
Total	5		481		486	

Table 8 shows the visual outcome with best correction where it was found that among 481 eyes with IOL, over 86% had either very good or good (3.7%), 3.7% had borderline and 6.4% had poor visual outcomes.

Table 8 Visual Outcome with best correction

	Non-IOL		IOL		Total	
	Eyes	%	Eyes	%	Eyes	%
Very good: can see 6/12	3	60.0%	414	86.1%	**417**	**85.8%**
Good: can see 6/18	0	0.0%	18	3.7%	**18**	**3.7%**
Borderline: can see 6/60	1	20.0%	18	3.7%	**19**	**3.9%**
Poor: cannot see 6/60	1	20.0%	31	6.4%	**32**	**6.6%**
Total	**5**	**100.0%**	**481**	**100.0%**	**486**	**100.0%**

Surgical complications were identified as the most common cause of poor visual outcomes in operated eyes (22/38), followed by selection (10/38), and sequelae (4/38). Both surgical complications and selection were important causes of borderline outcomes also.

Table 9 Causes of visual outcomes (eyes)

	Selection		Surgery		Spectacles		Sequelae		Can see 6/12		Total	
	Eyes	%	Eyes	%	Eyes	%	Eyes	%	Eyes	%	Eyes	%
Very good: can see 6/12	0	0.0	0	0.0	0	0.0	0	0.0	379	100.0	**379**	**78.0**
Good: can see 6/18	5	20.0	0	0.0	31	81.6	3	30.0	0	0.0	**39**	**8.0**
Borderline: can see 6/60	10	40.0	12	35.3	5	13.2	3	30.0	0	0.0	**30**	**6.2**
Poor: cannot see 6/60	10	40.0	**22**	**64.7**	2	5.3	4	40.0	0	0.0	**38**	**7.8**
Total	**25**	**100.0**	**34**	**100.0**	**38**	**100.0**	**10**	**100.0**	**379**	**100.0**	**486**	**100.0**

Table 10 shows that almost 95% of operated eyes in the last three years had very good or good vision; this reduces to 88% for those operated four to six years ago and 76%amongst eyes operated more than seven years ago.

Table10 VA in operated eyes in sample by years after surgery

	3 yrs postop		4 - 6 yrs postop.		7+ yrs postop		Total	
	Eyes	%	Eyes	%	Eyes	%	Eyes	%
Very good: can see 6/12	135	86.0%	145	80.1%	99	66.9%	**379**	**78.0%**
Good: can see 6/18	10	6.4%	15	8.3%	14	9.5%	**39**	**8.0%**
Borderline: can see 6/60	5	3.2%	11	6.1%	14	9.5%	**30**	**6.2%**
Poor: cannot see 6/60	7	4.5%	10	5.5%	21	14.2%	**38**	**7.8%**
Total	**157**		**181**		**148**		**486**	**100.0%**

The table below shows the age of males and females when they have undergone the surgery in Alipurduar. Majority of the population irrespective of gender reported surgery at the age of 50-59 years (38.5%) and 60-69 years (35.6%) respectively. However, around a two-point difference still exists in surgery among males and females in both the age groups. Sixteen percent of the population aged 70-79 years reported surgery among the studied groups where females (18.5%) had undergone more surgeries compared to men (13.5%).

Table 11 Age at time of surgery in males and females

Age in years	Males	%	Females	%	Total	%
1-29	1	0.5%	0	0.0%	1	0.2%
30-39	0	0.0%	0	0.0%	0	0.0%
40-49	14	6.3%	20	7.5%	34	7.0%
50-59	87	39.4%	100	37.7%	187	38.5%
60-69	81	36.7%	92	34.7%	173	35.6%
70-79	29	13.1%	49	18.5%	78	16.0%
80+	9	4.1	4	1.5%	13	2.7%
Total	221	100.0%	265	100.0%	468	100.0%

We do not see a huge difference in the place of surgery by sex in the studies district (Table 12). While a minor difference has prevailed those reported of undergone surgeries in voluntary/charitable hospitals and in a private hospital.

Table 12 Place of surgery by sex

	Males	%	Females	%	Total	%
Government Hospital	70	31.7%	84	31.7%	154	31.7%
Voluntary/charitable hospital	103	46.6%	126	47.5%	229	47.1%
Private hospital	48	21.1%	55	20.8	103	21.2%
Total	221	100.0%	265	100.0%	468	100.0%

Majority of cataract operations took place in Voluntary/ Charitable/ NGO hospitals (229/486), with over 90% achieving very good or good outcomes. Government hospitals were the second most common location (154/486); and almost 80% of eyes operated in these hospitals had either very good or good-outcomes. (Table 13)

Table 13 Visual outcomes by place of surgery (eyes)

	Gov. Hosp.		Vol. Hosp.		Priv. Hosp.		Total	
	Eyes	%	Eyes	%	Eyes	%	Eyes	%
Very good: can see 6/12	108	70.1	185	80.8	86	83.5	**379**	**78.0**
Good: can see 6/18	11	7.1	19	8.3	9	8.7	**39**	**8.0**
Borderline: can see 6/60	17	11.0	11	4.8	2	1.9	**30**	**6.2**
Poor: cannot see 6/60	18	11.7	14	6.1	6	5.8	**38**	**7.8**
Total	**154**		**229**		**103**		**486**	**100.0**

The table below shows the post-operation presenting VA and causes of borderline and poor outcomes of the selected population. Majority of the operated eyes hada very good visual outcome (VA 6/12), followed by good (8.0%) and borderline visual outcomes (6.2%). While 7.8% had a poor visual outcome (VA 6/60) in Alipurduar.

Table 14 Post-op presenting VA and causes of borderline and poor outcome

	Selection		Surgery		Spectacles		Sequelae		Can see 6/12		Total	
	Eyes	%	Eyes	%	Eyes	%	Eyes	%	Eyes	%	Eyes	%
Very good: can see 6/12	0	0.0%	0	0.0%	0	0.0%	0	0.0%	379	100.0%	**379**	**78.0%**
Good: can see 6/18	5	20.0%	0	0.0%	31	81.6%	3	30.0%	0	0.0%	**39**	**8.0%**
Borderline: can see 6/60	10	40.0%	12	35.3%	5	13.2%	3	30.0%	0	0.0%	**30**	**6.2%**
Poor: cannot see 6/60	10	40.0%	22	64.7%	2	5.3%	4	40.0%	0	0.0%	**38**	**7.8%**
Total	**25**	**100.0%**	**34**	**100.0%**	**38**	**100.0%**	**10**	**100.0%**	**379**	**100.0%**	**486**	**100.0**

Overall, 99% of all operated eyes had an intraocular lens (IOL) implanted (Table 15) which was found slightly higher among females (99.6%) than males (98.2%).

Table 15 Proportion and type of surgery

	Males	%	Females	%	Total	%
Non-IOL	4	1.8%	1	0.4%	5	1.0%
IOL	217	98.2%	264	99.6%	481	99.0%
Couching	0	0.0%	0	0.0%	0	0.0%
Total	221	100.0%	265	100.0%	468	100.0%

Effective Cataract surgical coverage (eCSC)
ECSC is the proportion of operated cataract cases that achieved a good post-operative visual outcome (6/18) of those who needed cataract surgery. This indicator presents a combined picture of service coverage and quality of care for cataract surgical services in the region.

As per the data 56.5% of those who needed cataract surgery in the population, got a good visual outcome post-surgery. This value was similar amongst both men and women.

Table 16 Effective Cataract Surgery Coverage

	eCSC 6/18
Male	55.6%
Female	57.2%
Total	56.5%

Barriers to cataract surgery

It was surprising to see that even amongst individuals (both men and women) with bilateral cataracts, 'need not felt' was the most common reason (28.8%) for not accessing the surgical services (Table 17). While 'fear of surgery' was the next most common barrier reported by men in our sample, 'cost' of surgery came out as a significant hurdle for women. "Inability to access services' and 'lack of awareness' that treatment was possible were also reported as frequent causes for untreated cataract blindness.

Table 17 Barriers to cataract surgery (Bilateral Cataract)

	Males		Females		Total	
	n	%	N	%	n	%
Need not felt	5	29.4%	10	28.6%	15	28.8%
Fear	4	23.5%	6	17.1%	10	19.2%
Cost	0	0.0%	6	17.1%	6	11.5%
Treatment denied by provider	1	5.9%	2	5.7%	3	5.8%
Unaware treatment is possible	2	11.8%	2	5.7%	4	7.7%
Cannot access treatment	2	11.8%	3	8.6%	5	9.6%
Local reason	3	17.6%	6	17.1%	9	17.3%
Total	**17**	**100.0%**	**35**	**100.0%**	**52**	**100.0%**

About a fourth of the surveyed population reported need not felt necessary for any surgery for unilateral BCVA<6/60 due to cataract. Interestingly this was reported more by the male participants (31.5%) than the female participants (21.3%). The second most reported barrier was fear of the surgery (13.5%) and female participants have more fear than the male participants. Unfortunately, treatment denied by the provider(11.9%) was also found as a barrier which was mostly reported by the male participants (15.7%) during the survey. Around 14.0% of the female participants mentioned that they were unable

to access the treatment. A major proportion of the surveyed population (24.2%) also mentioned other local reasons that as a barrier to availing the cataract surgery.

Table 18 Barriers to cataract surgery (unilateral BCVA<6/60 due to cataract)

	Males		Females		Total	
	n	%	N	%	N	%
Need not felt	34	31.5%	29	21.3%	63	25.8%
Fear	11	10.2%	22	16.2%	33	13.5%
Cost	6	5.6%	17	12.5%	23	9.4%
Treatment denied by provider	17	15.7%	12	8.8%	29	11.9%
Unaware treatment is possible	4	3.7%	5	3.7%	9	3.7%
Cannot access treatment	9	8.3%	19	14.0%	28	11.5%
Local reason	27	25.0%	32	23.5%	59	24.2%
Total	**108**	**100.0%**	**136**	**100.0%**	**244**	**100.0%**

Discussion

This study found the prevalence of blindness among people aged over 50 years in Alipurduar district of West Bengal to be 1.4% and found it slightly higher among women compared to men. The study also depicts age-specific differentials in reporting of any VI in Alipurduar meaning people in higher age groups have more visual related complications, which is common over the globe. A study done in south India (Nirmalan, et. Al., 2003) also found that surgical coverage for cataract was lower among females than males[1].

The table below (Table 19) shows data for the main indicators measured in this survey as compared to national and state average data. In the Alipurduar district, the prevalence of blindness was comparatively lower than the national and state prevalence. Similarly, the prevalence of SVI, MVI, and VI were also low in our studied district. Cataract surgical coverage (CSC) among cataract blinds (VA <3/60 in better eye) was 89.8% (males 94.6% and females 86.6%) in Alipurduar which was also lower than the national (93.2%) and state (94.6) average. However, no such difference exists in the prevalence of very good and good outcomes for VA>6/18.

Table 19 Selected survey indicators for four study districts.

Indicator	India	West Bengal	Alipurduar
Blindness %(95% CI) **(PVA<3/60)**	1.99% Male Female	1.6% M – 1.0% F - 2.2%	1.5% M- 1.1% F – 2.1%
SVI % (95% CI) **(3/60<PVA<6/60)**	1.96	1.6%	1.8%
MVI %, (95% CI) **(3/60<PVA<6/50)**	9.8%	8.9%	6.6%
VI	13.8%	11.9%	9.7%
CSC (person)	**VA 3/60 -** 93.2% Male - 94.8% Female - 91.9% **VA 6/60** – 89.0% Male – 90.7% Female - 87.7%	**VA 3/60 -** 94.6% Male – 99.1% Female – 90.7% **VA 6/60** – 91.0% Male – 93.9% Female – 88.4%	**VA 3/60** – 89.8% Male – 94.6% Female – 86.6% **VA 6/60** – 83.9% Male – 90.1% Female – 79.7%
Very good and good outcomes % **(VA>6/18)**	83.9%	83.9%	84.0%
Poor vision **outcomes** % **(VA<6/60)**	8.5%	6.7%	7.9%

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1771766/

Untreated cataract (80.9%) continued to be the most common cause of bilateral blindness. Cataract surgical complications (6.4%) and non-trachomatous corneal opacities (6.4%) were the other most common causes of blindness in the studied district. Similarly, untreated cataract was found to be the principal cause of severe VI and moderate VI. A study by Flaxman, et al., in their systematic review also mentioned that cataract and under corrected refractive error were the most common causes of vision impairment[2] . Worldwide, unaddressed refractive error (URE) is the leading cause of vision impairment and the second leading cause of blindness in developing countries, including India[3]. Our study also found similar findings that URE was the most common cause of early VI and the second most important cause of moderate VI among the participants. Study findings also highlighted a sex difference in the prevalence of Blindness due to Untreated cataract (women-1.1%; men-0.3%). Around 90% of the sampled population underwent the CSC in Alipurduar for VA <3/60 and 486 eyes were operated for cataract. However, surgical complications were identified as the most common cause of visual outcomes in operated eyes.

Voluntary/ Charitable/ NGO hospitals (47.1%) were found to be the most preferred source for cataract surgery with over 90% achieving very good or good outcomes. Followed by the Government hospitals (31.2%), and almost 80% of eyes operated in these hospitals had either very good or good outcomes.

But availing of this service was not free from barriers for the sample participants. In terms of barriers to care, cost has always been a big barrier, while lack of awareness is another major reason behind such high prevalence of cataract in the country. Our finding shows lack of awareness i.e., not having had surgery was not feeling a need (28.8%) as the most common reason for not getting cataract surgery. Which was followed by fear of the surgery (19.2%), and other local reasons (17.3%). Interestingly, fear of surgery (23.1%) was mostly reported by the men while the cost (17.1%) of the surgery was a barrier for women in Alipurduar. Sometimes, poor infrastructural facilities or non-availability of equipped operation theatre for ophthalmic microsurgery in rural and remote areas and the non-availability of trained ophthalmologists also stood as barriers to access care.

[2]https://www.thelancet.com/pdfs/journals/langlo/PIIS2214-109X(17)30393-5.pdf
[3]https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2566380/pdf/11285669.pdf

Implications for programmes and policy

Based on the results of the study, we feel the following implications for the planning and implementation of eye care services in the region.

1. Since the overall prevalence of blindness is almost at par with the average value for the state, there needs to be consistent focus on this district while planning the state level services.
2. Considering the remote location of the district, it would need considerably higher resources to tackle the same level of the problem compared to that planned for the other more accessible regions.
3. Clear indications of gender inequity with females disadvantaged across the blindness and visual impairment spectrum highlight the need for gender responsive programming at all levels.
4. Cataract remains the most significant component of the problem at all levels especially for women. This indicates sustained emphasis on strengthening cataract services at all levels for both demand and supply of the same.
5. While the Cataract surgical coverage (CSC), seems to be at a satisfactory level, women with cataract are still not getting the care equitably. Also there needs to be a push to improve the quality of surgical services to increase the effective CSC rate.
6. Other eye diseases like uncorrected refractive errors and other significant posterior segment disease (such as Glaucoma and DR), may be at a lower level at present but there is evidence to suggest that their prevalence is rising, and the existing systems need to be prepared to handle these in the near future.

References

1. World Vision Report, World Health Organization, 2019
2. National Blindness & Visual Impairment Survey India 2015-19- A summary report, Directorate General Health Services, Ministry of Health & Family Welfare, Government of India, 2020
3. Mannava, Sunny et.al; “Current estimates of the economic burden of blindness and visual impairment in India: A cost of illness study”, Indian Journal of Ophthalmology, 2021
4. Vision Atlas: https://www.iapb.org/learn/vision-atlas/magnitude-and-projections/countries/india
5. M. Despande, et. al; Vision 2020: Right to Sight- India, National Center for Biotechnology Information, MJAFI, 2011
6. Census 2011, West Bengal, Registrar General of India, Ministry of Home Affair, Government of India
7. RAAB Instruction Manual, International Center for Eye Health, 2007

Appendices

Appendix-1: Institutional Review Board Approval

Vivekananda Mission Ashram (VMA)

Institutional review board

Research Proposal Cover Sheet

STUDY TITLE	Magnitude and causes of Visual Impairment and Blindness in Rural districts of UP (Kasganj) and West Bengal (Alipurduar)
Presenter	
Principal Investigator (1st Author)	Dr Sandeep Buttan (Sightsavers, India), Emma Jolley (Sightsavers, UK)
Co-Investigators (Co-authors)	Dr. Asim Sil, (VMA) ; Dr Shalinder Sabherwal (SCEH)
Proposed Start Date	Aug 2021
Study Completion Date	Dec 2021
Manuscript Submission Date	2nd August, 2021
Study total cost	
Potential funding sources (if any)	Sightsavers
Date of Submission:	28 July 2021

Department Head Approval	**Signature 1:**	**Signature 2:**

IRB Consideration date:	**11th August, 2021**
Suggestions by IRB:	**1. The team should properly maintain Covid protocol.** **2. The team should be consistent.**
IRB Decision	**Approved/Disapproved/Modifications suggested & to present again/Modifications suggested but approved/EC Approval required**

NOTE: Please attach protocol (Concept note, Manuscript) covering **"Title, Introduction, Scientific rationale, Design, Methodology, Inclusion/Exclusion criteria, Analysis plan"** with this form.

Narayan Chandra Maiti

Signature of the IRB Chairperson

Signature of the External faculty

VIVEKANANDA MISSION ASHRAM VIVEKNAGAR CHAITANYAPUR (HALDIA) PURBA MEDINIPUR

Sightsavers

Appendix-2: Approval from Government of West Bengal

Govt. of West Bengal
Directorate of Health Services
Ophthalmology Wing
National Programme for Control of Blindness & Visual Impairment
Swasthya Bhawan, 'A' - Wing, 2nd Floor, G.N. - 29,
Sector – V, Salt Lake City, Kolkata – 700 091;
E. Mail: adhsophth@gmail.com. Tel: 033 2357 4074/2333 0204

Memo No: - HFW-27022/5/2019-ADMIN SEC(DHS)(HFW)-Dept.of H&FW-Part(1)/314 Date: 10 /08/2021

ORDER

Sub:- RAAB (Rapid Assessment of Avoidable Blindness) survey at Alipurduar district

As per the existing MoU between the Dept. of Health and Family Welfare, West Bengal and the Sightsavers India, the International Development Agency working on the Vision Care, the *NETRA VASANT* initiative has been remaining on at the ten odd districts in this State since 2016. Out of those districts, the Alipurduar district has been taken in 2020 as the first district for the implementation of the HIGH IMPACT program, an intensified version of the NETRA VASANT initiative. The objective of the program is to marked augmentation of the eye care services in general and specifically the enhancement of the overall Cataract Surgery Coverage.

The RAAB (Rapid Assessment of Avoidable Blindness) survey will be conducted at Alipurduar to understand the prevalence of the Avoidable Blindness in the community during the initial stages of the implementation of the HI program. The observations from this survey will help preparing the customized road-map for the optimal implementation of the HI program. This will be the first such survey in the North Bengal region of the State and quite naturally this also might help understanding the prevailing situation at the other districts of the same region.

The SIX number of the Senior Resident Eye Surgeons (SR) from the different districts of the Northern region of the State and the FOUR Second Year Eye Post-graduate Trainees (PGTs) from RIO, Kolkata, MCH will take part in this survey at Alipurduar from the 24th August to 6th September 2021 to work as the Ophthalmologists. The survey would be in two partly over-lapping phases and each phase would be manned by the two sets of survey-doctors. The survey will be as per the international protocol for the same. The concerned survey will be coordinated by the Sightsavers but under the direct monitoring from the State program division as well as from the concerned District authority.

The first phase of the survey will be from the 24th August to 1st September 2021 and will be done by the RIO PGTs. The second phase would be by the SRs group survey teams from the 31st August to 6th September 2021. In extreme of cases, the survey may extend for the 2/3 additional days too.

All of the surveyor-ophthlmologists will essentially participate in the pre-survey high level training at Siliguri at the Siliguri Greater Lions Eye Hospital venue from the 19th August to 22nd August 2021. (Annexure-A). However, the surveyor-doctors of the first batch would be released only after the joining of the second batch surveyor-doctors. The doctors in the second batch would do their normal duties (SR-ship) at their respective places during the period between the training and their turn of the survey work.

The Four young proactive faculty members, two each from the RIO Kolkata and from the Dept of Eye from North Bengal Medical College Hospitals, would also participate only in the pre-survey 4 days' training session for the full period. They will be used as trainers for the RAAB/similar other ophthalmic surveys in the other parts of the State in future. They would be nominated by the respective Director/MSVP in consultation with the HoD. The office order, with the contact number/mail ID etc. details for these nominated faculty trainees MUST reach the SPO-NPCB (with Cc to DME & DHS) on the *very date* of receipt of this memo.

The respective Principal/ Director/ MSVP/ CMOH/ Superintendent are requested to take necessary action to release the Eye Surgeon as per Annexure, so that the EYE Surgeon should attend the Pre-Survey training & Survey work on the date positively.

All the expenses for this training as well as for the entire survey event viz. for the arrangements for the travel, food, accommodation, other logistics support, honorarium etc. would be borne by the Sightsavers.

This has an approval from the competent authority.

All concerned are hereby informed to take necessary action and to extend an all out support in the greater public services.

Encl.: Annexure-A

10/8/2021

Director of Medical Education
Dept. of Health & Family Welfare
Govt. of West Bengal

10/8/21

Director of Health Services
Dept. of Health & Family Welfare
Govt. of West Bengal

Memo No: - HFW-27022/5/2019-ADMIN SEC(DHS)(HFW)-Dept.of H&FW-Part(1)/314/1(17) Date: 10/08/2021
Copy forwarded for information and necessary action to the:

1. MD-NHM & Secretary (PHP), Department of Health & Family Welfare, Govt. of West Bengal.
2. Additional MD-NHM, Department of Health & Family Welfare, Govt. of West Bengal.
3. Program Officer-I, NHM, & Program Officer-II, NHM, Deptt of H&FW, Govt. of West Bengal.
4. Dr. Susanta Kumar Roy, Eye Surgeon, The OSD, Public Health, North Bengal region of the State, Government of West Bengal with a request to please arrange to keep a watch on the event for its meaningful execution.
5. Joint DHS, NCD, Department of Health & Family Welfare, Govt. of West Bengal.
6. DDHS (Admin)., Department of Health & Family Welfare, Govt. of West Bengal.
7. Dr. Kalyan Mukherjee (M:9432122080/9748844250), ADHS(Ophth) & SPO- NPCB&VI, Deptt of H&FW, Govt. of WB.
8. Director, RIO, Kolkata MCH.
9. Principal & MSVP& HOD (Ophth) – NB MCH/ Malda MCH
10. (i) Chief Medical Officer of Health- Alipurduar/ Jalpaiguri/ Malda. (ii)The CMOH- Jalpaiguri or his authorised official like the DPM-NPCB&VI there would coordinate the entire training event keeping daily level close liaison & (iii) The CMOH- Alipuduar or his authorised official like the DPM-NPCB&VI there would coordinate the entire survey event keeping daily level close liaison with the State/district general administration/SIGHTSAVERS/Their IMPLEMENTING PARTNER AGENCIES/related others.
11. Dy. CMOH-II Cum DPM-NPCB&VI – Alipurduar/ Jalpaiguri/ Malda
12. Superintendent – Alipurduar DH/ Falakata SSH/ Jalpaiguri DH/ Mal SSH
13. All surveyor-doctors .....
14. Sr. PA to Principal Secretary, Department of Health & Family Welfare, Govt. of West Bengal.
15. Mr. Sudipto Mohanty, Area Director, Sightsavers India(East)
16. Smt. Sampa Paul (M:9433361739/9804512494); E-mail ID:<spaul@sightsavers.org>) State Program Lead, East Area Office, Sightsavers India, Kolkata.
17. Office Copy.

10/08/2021

Director of Medical Education
Dept. of Health & Family Welfare
Govt. of West Bengal

Director of Health Services
Dept. of Health & Family Welfare
Govt. of West Bengal

Appendix 3: RAAB IOV form

ASSESSMENT OF INTER - OBSERVER VARIATION - RAAB

Examiner _____ **Patient ID**

B. VISION

Uses distance glasses **No:**O(1) **Yes:**O(2)

Uses reading glasses **No:**O(1) **Yes:**O(2)

Presenting vision	**Right eye**	**Left eye**
Can see 6/12	O(1)	O(1)
Cannot see 6/12 but can see 6/18	O(2)	O(2)
Cannot see 6/18 but can see 6/60	O(3)	O(3)
Cannot see 6/60 but can see 3/60	O(4)	O(4)
Cannot see 3/60 but can see 1/60	O(5)	O(5)
Light perception (PL+)	O(6)	O(6)
No light perception (PL	O(7)	O(7)

Pinhole vision	**Right eye**	**Left eye**
Can see 6/12	O(1)	O(1)
Cannot see 6/12 but can see 6/18	O(2)	O(2)
Cannot see 6/18 but can see 6/60	O(3)	O(3)
Cannot see 6/60 but can see 3/60	O(4)	O(4)
Cannot see 3/60 but can see 1/60	O(5)	O(5)
Light perception (PL+)	O(6)	O(6)
No light perception (PL	O(7)	O(7)

C. LENS EXAMINATION	**Right eye**	**Left eye**
Normal lens/minimal lens opacity:	O(1)	O(1)
Obvious lens opacity:	O(2)	O(2)
Lens absent (aphakia):	O(3)	O(3)
Pseudophakia without PCO:	O(4)	O(4)
Pseudophakia with PCO:	O(5)	O(5)
No view of lens:	O(6)	O(6)

D. MAIN CAUSE OF PRESENTING VA<6/12

(Mark only one cause for each eye)

	Right eye	**Left eye**	**Principal cause in persons**
Refractive error:	O(1)	O(1)	O(1)
Aphakia, uncorrected:	O(2)	O(2)	O(2)
Cataract, untreated:	O(3)	O(3)	O(3)
Surgical complications:	O(4)	O(4)	O(4)
Trachomacorneal opacity:	O(5)	O(5)	O(5)
Other corneal opacity:	O(6)	O(6)	O(6)
Phthisis:	O(7)	O(7)	O(7)
Onchocerciasis:	O(8)	O(8)	O(8)
Glaucoma:	O(9)	O(9)	O(9)
Diabetic retinopathy:	O(10)	O(10)	O(10)
ARMD:	O(11)	O(11)	O(11)
Other posterior segment:	O(12)	O(12)	O(12)
All globe/CNS abnormalities:	O(13)	O(13)	O(13)
Not examined (can see 6/12)	O(14)	O(14)	O(14)

Appendix 4- RAAB Survey form

RAPID ASSESSMENT FOR AVOIDABLE BLINDNESS

A.GENERALINFORMATION **Year-month:** **-Survey area:___** **Cluster:** **Individual no.:**
Name:_____ **Sex:** Male: O(1) Female: O (2) **Age (years):**

Optional 1:
Optional 2:

Examination status:
Examined: O (1) (go to B) Refused: O (3) (go to E)
Not available: O (2) (go to E) Not able to communicate: O (4) (go to E)

Always ask: "Did you ever have any problems with your eyes?" Yes: O (1) No: O (2)

If not available - details (availability / tel number / address)

B. VISION

Uses distance glasses: No: O(1) Yes: O(2)
Uses reading glasses: No: O(1) Yes: O(2)

Presenting vision	**Right eye**	**Left eye**
Can see 6/12	O(1)	O(1)
Cannot see 6/12 but can see6/18	O(2)	O(2)
Cannot see 6/18 but can see6/60	O(3)	O(3)
Cannot see 6/60 but can see 3/60	O(4)	O(4)
Cannot see 3/60 but can see 1/60	O(5)	O(5)
Light perception (PL+)	O(6)	O(6)
No light perception(PL-)	O(7)	O(7)

Pinhole vision	**Right eye**	**Left eye**
Can see 6/12	O(1)	O(1)
Cannot see 6/12 but can see 6/18	O(2)	O(2)
Cannot see 6/18 but can see 6/60	O(3)	O(3)
Cannot see 6/60 but cansee 3/60	O(4)	O(4)
Cannot see 3/60 but can see 1/60	O(5)	O(5)
Lightperception(PL+)	O(6)	O(6)
No lightperception(PL-)	O(7)	O(7)

E. HISTORY, IF NOT EXAMINED

(From relative or neighbour)

Believed	**Right eye**	**Left eye**
Not blind	O(1)	O(1)
Blind due to cataract	O(2)	O(2)
Blind due to other causes	O(3)	O(3)
Operated for cataract	O(4)	O(4)

C. LENS EXAMINATION	**Right eye**	**Left eye**
Normal lens / minimal lens opacity:	O(1)	O(1)
Obvious lens opacity:	O(2)	O(2)
Lens absent (aphakia):	O(3)	O(3)
Pseudophakia without PCO:	O(4)	O(4)
Pseudophakia with PCO:	O(5)	O(5)
No view oflens:	O(6)	O(6)

D. MAIN CAUSE OF PRESENTING VA<6/12 *(Mark only one cause for each eye)*	**Right eye**	**Left eye**	**Principal cause in person**
Refractive error:	O(1)	O(1)	O(1)
Aphakia, uncorrected:	O(2)	O(2)	O(2)
Cataract, untreated:	O(3)	O(3)	O (3)**(F)**
Cataract surg. complications:	O (4)	O(4)	O(4)
Trachoma corneal opacity:	O(5)	O(5)	O(5)
Other corneal opacity:	O(6)	O(6)	O(6)
Phthisis:	O(7)	O(7)	O(7)
Onchocerciasis:	O(8)	O(8)	O(8)
Glaucoma:	O(9)	O(9)	O(9)
Diabetic retinopathy:	O(10)	O(10)	O(10)
ARMD:	O(11)	O(11)	O(11)
Other posterior segment:	O(12)	O(12)	O(12)
All globe/CNS abnormalities:	O(13)	O(13)	O(13)
Not examined: can see 6/12	O(14)	O(14)	O(14)

F. WHY CATARACT SURGERY WAS NOT DONE

(Mark up to 2 responses, if VA<6/18, not improving with pinhole, with visually impairing lens opacity in one or both eyes)

Need not felt	O(1)
Fear of surgery or poor result	O(2)
Cannot afford operation	O(3)
Treatment denied by provider	O(4)
Unaware that treatment is possible	O(5)
No access to treatment	O(6)
Local reason (optional)	O(7)

G. DETAILS ABOUT CATARACT OPERATION

	Right eye	Left eye
Age at operation (years)		
Place of operation		
Government hospital	O(1)	O(1)
Voluntary /charitable hospital	O(2)	O(2)
Private hospital	O(3)	O(3)
Eye camp /improvised setting	O(4)	O(4)
Traditional setting	O(5)	O(5)
Type of surgery		
Non IOL	O(1)	O(1)
IOL implant	O(2)	O(2)
Couching	O(3)	O(3)
Cost of surgery		
Totally free	O(1)	O(1)
Partially free	O(2)	O(2)
Fully paid	O(3)	O(3)
Cause of VA<6/12 after cataract surgery		
Ocular comorbidity (Selection)	O(1)	O(1)
Operative complications (Surgery)	O(2)	O(2)
Refractive error (Spectacles)	O(3)	O(3)
Longterm complications (Sequelae)	O(4)	O(4)
Does not apply - can see 6/12	O(5)	O(5)

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We work with partners in low- and middle-income countries to eliminate avoidable blindness and promote equal opportunities for people with disabilities.

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