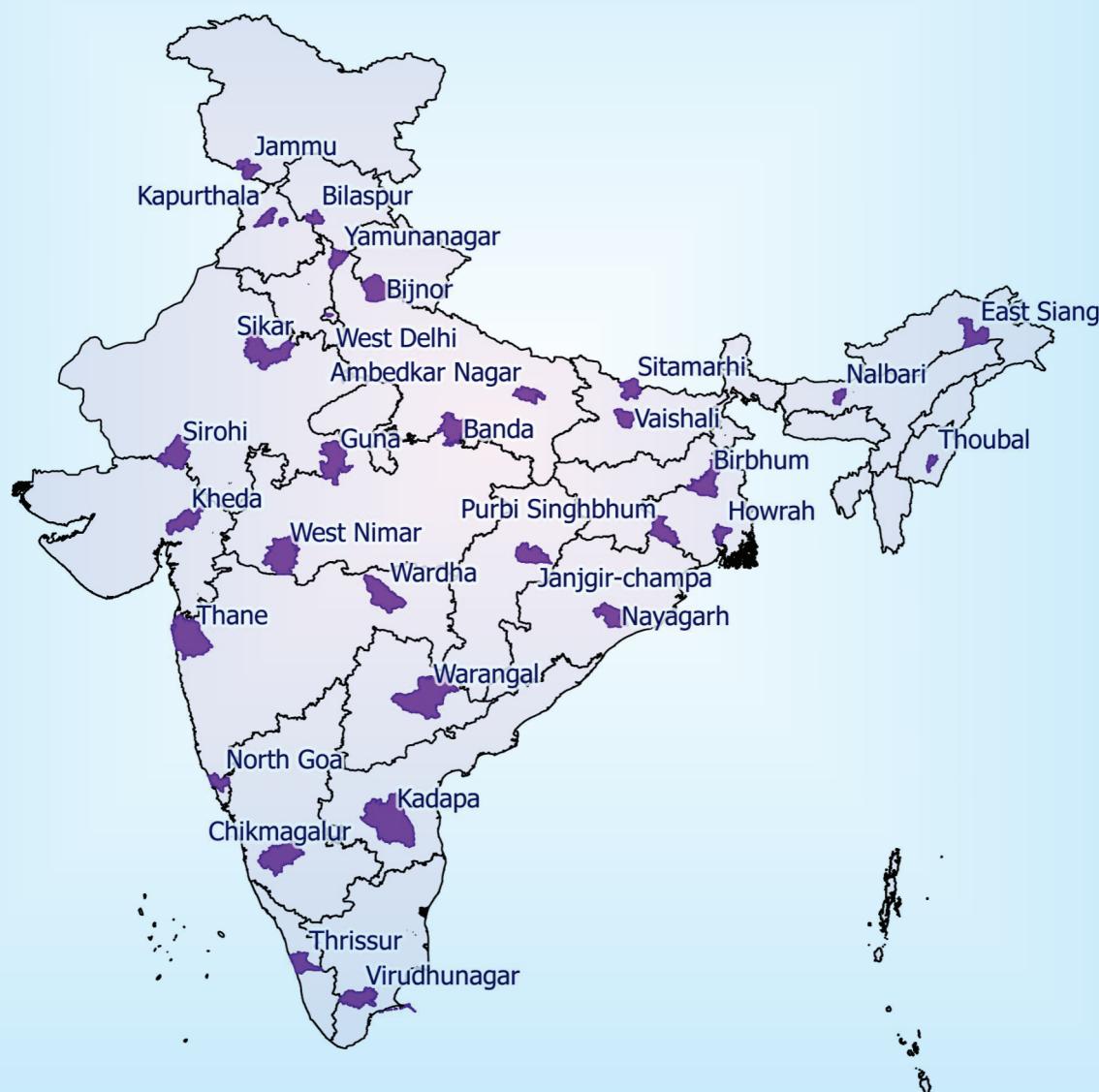




## NATIONAL BLINDNESS & VISUAL IMPAIRMENT SURVEY INDIA 2015-2019 – A SUMMARY REPORT



National Programme for Control of Blindness & Visual Impairment,  
Directorate General of Health Services,  
Ministry of Health & Family Welfare, Government of India, New Delhi

SURVEY CONDUCTED BY:  
Dr. Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, New Delhi

## Key Findings

Indicators	Percentage
<b>Prevalence of Blindness &amp; Visual Impairment</b>	
Prevalence of blindness in all age groups	0.36
Prevalence of blindness in population aged $\geq 50$ years	1.99
Prevalence of severe visual impairment (SVI) in all age groups	0.35
Prevalence of severe visual impairment (SVI) in population aged $\geq 50$ years	1.96
Prevalence of moderate visual impairment (MVI) in all age groups	1.84
Prevalence of moderate visual impairment (MVI) in population aged $\geq 50$ years	9.81
Prevalence of early visual impairment (EVI) in all age groups	2.92
Prevalence of early visual impairment (EVI) in population aged $\geq 50$ years	12.92
Prevalence of moderate severe visual impairment (MSVI) in all age groups	2.19
Prevalence of moderate severe visual impairment (MSVI) in population aged $\geq 50$ years	11.77
Prevalence of visual impairment (VI-Blindness+MSVI) in all age groups	2.55
Prevalence of visual impairment (VI-Blindness+MSVI) in population aged $\geq 50$ years	13.76
<b>Major Causes of Blindness in population aged <math>\geq 50</math> years</b>	
Cataract	66.2
Corneal opacity (including trachomatous)	8.2
Cataract surgical complications (including PCO)	7.2
Posterior segment disease (excluding DR & ARMD)	5.9
Glaucoma	5.5
<b>Major Causes of Visual Impairment in population aged <math>\geq 50</math> years</b>	
Cataract	71.2
Refractive error	13.4
Cataract surgical complications (including PCO)	5.9
<b>Major Causes of Blindness in population aged 0-49 years</b>	
Corneal opacity	37.5
All globe/ CNS abnormality (Amblyopia)	25.0
Phthisis	12.5
Other/undetermined	25.0
<b>Major Causes of Visual Impairment in population aged 0-49 years</b>	
Refractive error	29.6
Cataract	25.4
All globe/ CNS abnormality (Amblyopia)	15.5
Corneal opacity	14.1
<b>Cataract Surgical Coverage (persons) in population aged <math>\geq 50</math> years</b>	
Visual Acuity<3/60	93.2
Visual Acuity<6/18	74.0
<b>Cataract Surgical Coverage (eyes) in population aged <math>\geq 50</math> years</b>	
Visual Acuity<3/60	80.2
Visual Acuity<6/18	57.2
<b>Proportion of IOL Cataract Surgery in population aged <math>\geq 50</math> years</b>	
With Intra Ocular Lense	94.2
<b>Visual Outcomes (BCVA) after Cataract surgery in population aged <math>\geq 50</math> years</b>	
Very good (can see 6/12)	73.4
Good (cannot see 6/12 but can see 6/18)	10.5
Borderline (cannot see 6/18 but can see 6/60)	7.6
Poor (cannot see 6/60)	8.5

## **1      Introduction**

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 endeavor with IAPB, to eliminate avoidable blindness by 2020. 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.

The National Blindness and Visual Impairment Survey 2015-2019 was conducted in order to provide the evidence about the present status of blindness and visual impairment in India. The survey was planned by the Ministry of Health and Family Welfare, Government of India. Dr Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, New Delhi was responsible for planning and executing the field work, monitoring, analysis and report writing of the survey. The survey was conducted in partnership with various reputed Eye Health Institutes of the country.

The Survey was conducted in aged  $\geq 50$  years population using Rapid Assessment of Avoidable Blindness (RAAB) strategy in 31 districts of 24 States/Union Territories of India from September 2015- June 2018. This house-to-house survey was designed to generate representative data for the sampled districts as well as for India. Both rural and urban areas were included in this survey. An additional survey was conducted in 0-49 years age group in Jan-Feb 2019. This survey was conducted in 6 districts selected from six zones (north, south, east, west, central and northeast) of India. The results of both surveys, in 0-49 age group and in  $\geq 50$  years population, were used to estimate the prevalence of blindness and visual impairment in India across all age groups.

### **Objectives of the survey**

- 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

## **2      Methods**

The survey in population aged  $\geq 50$  years was done using the Rapid Assessment of Avoidable Blindness (RAAB-6) methodology developed at the International Centre for Eye Health (ICEH), London and recommended by the WHO. The RAAB survey methodology was developed as a rapid and cost-effective survey method for the assessment of avoidable blindness. A total of 31 districts were randomly selected among the districts in India for the survey and a sample size of 3,000 was calculated to represent each district. Hence, total sample size estimated for the 31 districts was thus 93,000. The districts and the clusters within districts were chosen using PPS (probability proportionate to size) sampling. Further, segments were identified within each cluster and one of them was randomly picked up and covered by compact segment sampling technique. The prevalence of blindness and visual impairment were assessed based on presenting visual acuity, followed by ophthalmic examination to rule out the causes of blindness and visual impairment as per the RAAB protocol. A direct age and sex standardization of each district's survey data to that district's population age-sex structure was done as per the 2011 census, to estimate district-wise prevalence. Finally, in order to account for variation in population size of various districts, each district was allotted a sampling weight based on the district's total population aged  $\geq 50$  years. These weights were applied on the standardized district prevalence to calculate the overall prevalence across 31 districts, which was extrapolated to the entire country.

For 0-49 years population survey, sample size was estimated as 18,000 for the country. One district was chosen from each of the 6 zones of the country to ensure the heterogeneity of the sample population. A total of 3,000 individuals aged 0-49 years were enumerated in each district. In this survey, 30 clusters were selected randomly from each district and 100 individuals were covered in each cluster.

Results of both these surveys were used to estimate the prevalence of blindness, SVI, MVI, EVI, MSVI and VI across all age groups in India. Based on the prevalence of blindness and VI, the total number of blind and visually impaired persons were extrapolated for the country for the year 2017.

## **Definitions used in the National blindness and visual impairment survey**

**Table 1: Definitions of blindness and visual impairment**

Blindness	Presenting visual acuity < 3/60 in better eye with available correction
Severe visual impairment (SVI)	Presenting visual acuity < 6/60 – 3/60 in better eye with available correction
Moderate visual impairment (MVI)	Presenting visual acuity < 6/18 – 6/60 in better eye with available correction
Early visual impairment (EVI)	Presenting visual acuity < 6/12 – 6/18 in better eye with available correction
Moderate severe visual impairment (MSVI)	Presenting visual acuity < 6/18-3/60 in better eye with available correction
Visual impairment (VI)	Presenting visual acuity < 6/18 in better eye with available correction
Functional low vision	A person with impairment of visual functioning even after treatment and/or standard refractive correction, and a visual acuity of less than 6/18 to light perception, or a visual field of less than 10 degree from the point of fixation, but who uses, or is potentially able to use, vision for planning and/or execution of a task.
Blindness (BCVA/Pinhole <3/60)	Best corrected visual acuity <3/60 in better eye

## **3 Result**

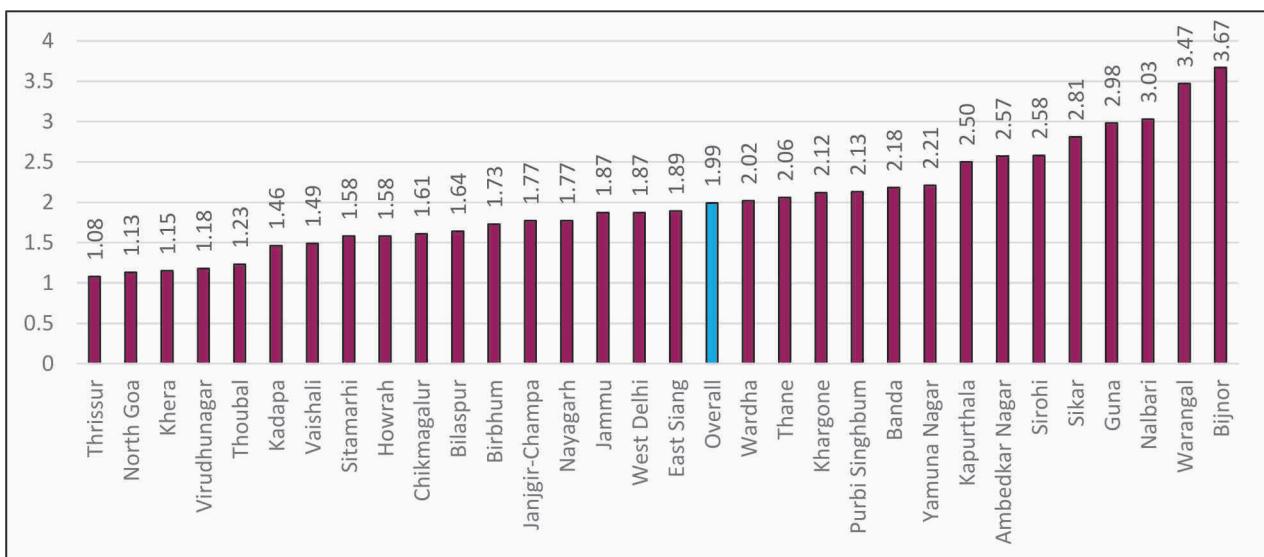
### **Survey in population aged $\geq 50$ years**

#### **Prevalence of blindness & visual impairment**

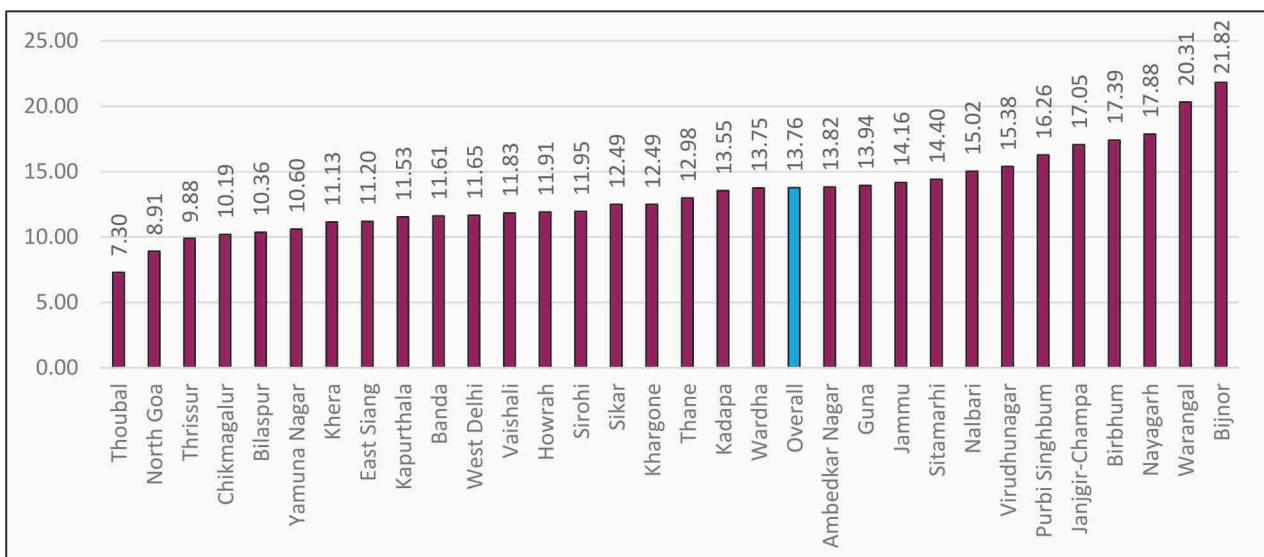
Out of 93,108 enumerated individuals with aged  $> 50$  years in 31 districts, 85,135 persons were examined with an overall response rate of 91.5%. The estimated prevalence of blindness was 1.99%, SVI 1.96%, MVI 9.81%, EVI 12.92%, MSVI 11.77% and VI 13.76%. Prevalence of functional low vision was 1.03% and that of blindness <3/60 (using pinhole) was 1.75%. The prevalence of blindness and visual impairment was lowest in Thrissur district (Kerala) and in Thoubal district (Manipur) respectively. Bijnor district (Uttar Pradesh) had the highest prevalence of both blindness and visual impairment.

**Table 2: Prevalence of blindness & visual impairment in population aged  $\geq 50$  years**

Indicators (based on better eye VA)	Male $\geq 50$ years	Female $\geq 50$ years	Total $\geq 50$ years
	%	%	%
Blindness (PVA <3/60)	1.67	2.31	1.99
SVI (PVA <6/60-3/60)	1.60	2.32	1.96
MVI (PVA <6/18-6/60)	9.21	10.41	9.81
EVI (PVA <6/12-6/18)	11.90	13.94	12.92
MSVI (PVA <6/18-3/60)	10.82	12.73	11.77
VI (PVA <6/18)	12.49	15.04	13.76
Functional Low Vision	0.93	1.13	1.03
Blindness (BCVA/Pinhole <3/60)	1.43	2.07	1.75

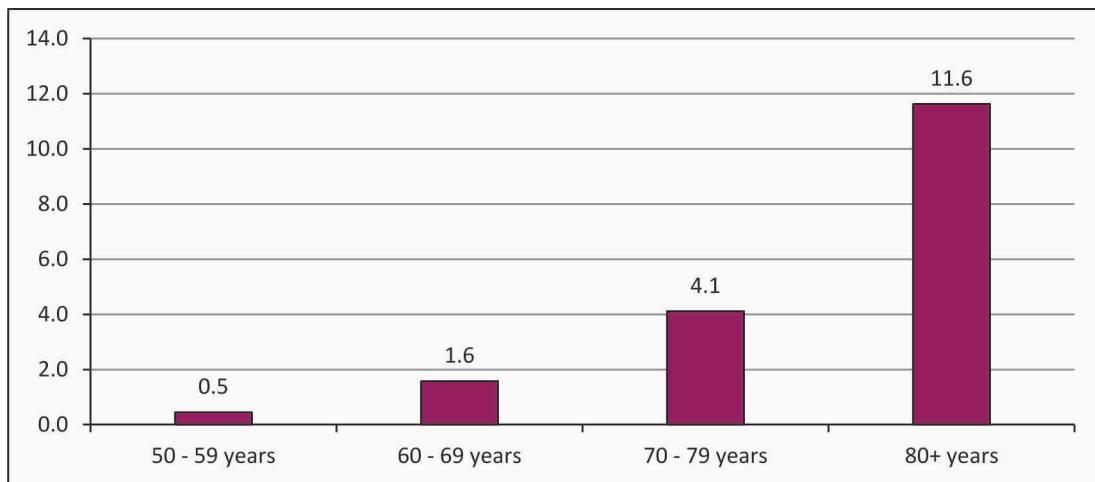


**Figure 1: District wise prevalence of blindness in population aged  $\geq 50$  years**



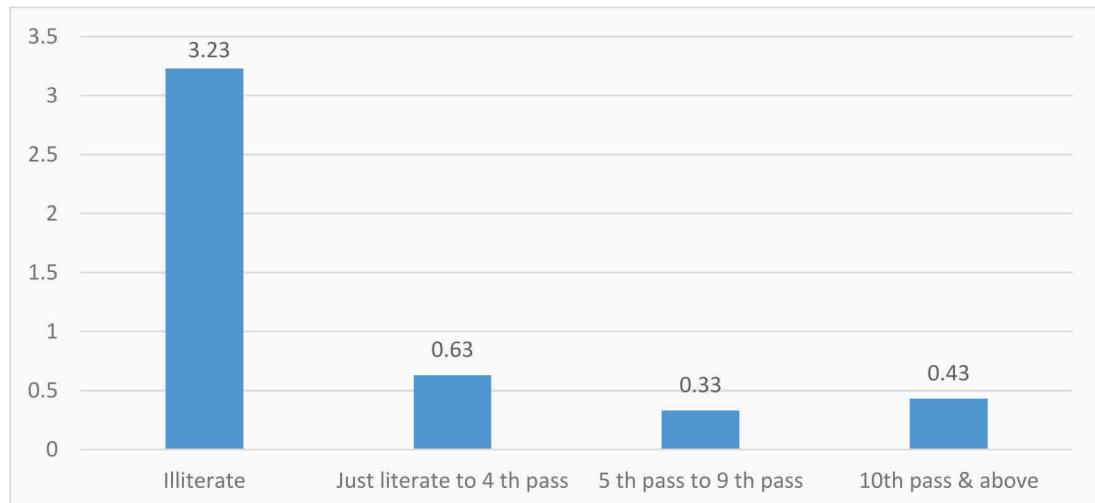
**Figure 2: District wise prevalence of visual impairment in population aged  $\geq 50$  years**

Maximum prevalence of blindness was seen in 80+ age group (11.6%), followed by 70-79 age group (4.1%), 60-69 age group (1.6%) and 50-59 age group (0.5%)



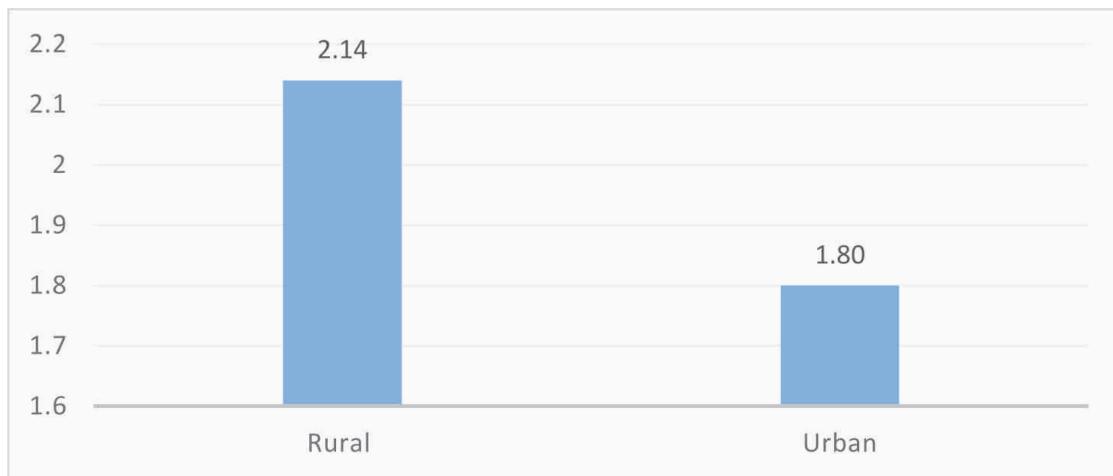
**Figure 3: Age wise prevalence of blindness in population aged  $\geq 50$  years**

Blindness was higher among illiterates (3.23%) compared to literate population. It was only 0.43% among 10th pass and above.



**Figure 4: Literacy wise prevalence of blindness in population aged  $\geq 50$  years**

Blindness was more prevalent in the rural population as compared to urban population. 2.14% vs 1.80%



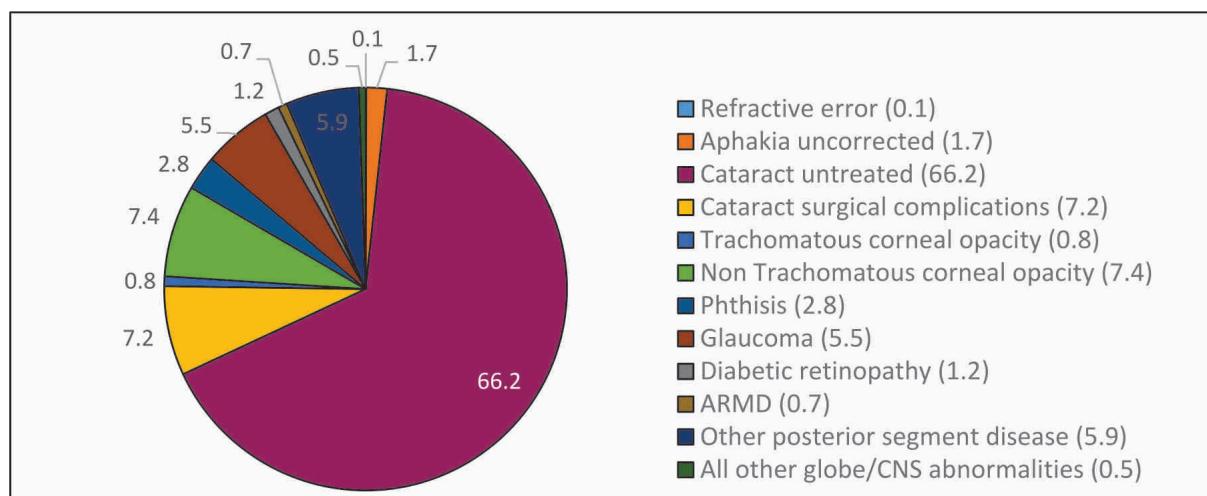
**Figure 5: Urban rural wise prevalence of blindness in population aged  $\geq 50$  years**

## Causes of blindness and visual impairment

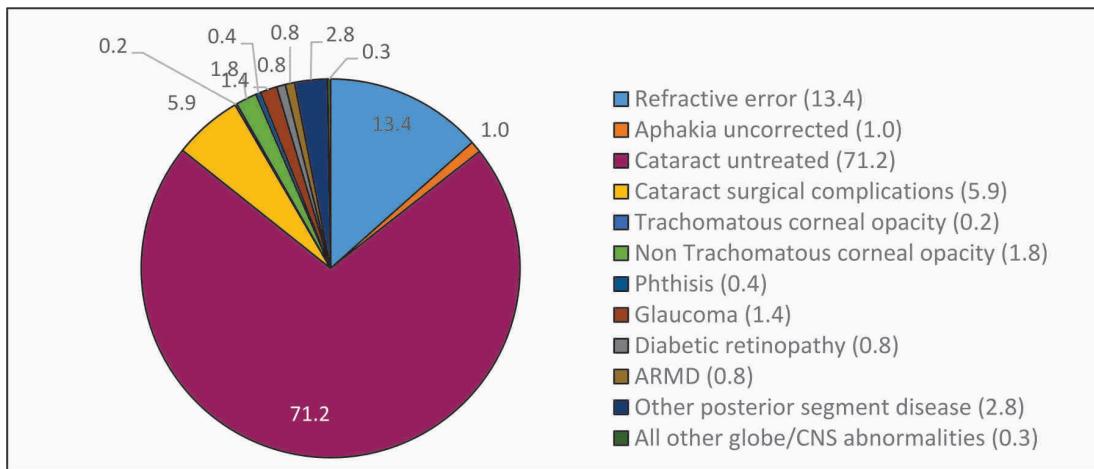
Cataract was the principal cause of blindness (66.2%), severe visual impairment (80.7%), and moderate visual impairment (70.2%) (Table 3). The other important causes of blindness were corneal opacity (7.4%), cataract surgical complications (7.2%), posterior segment disorders excluding DR and ARMD (5.9%) and glaucoma (5.5%). Principal causes of severe visual impairment other than cataract were cataract surgical complications (8.3%) and other posterior segment diseases excluding DR and ARMD (3.4%). For early visual impairment, the most important cause was refractive error (70.6%).

**Table 3: Causes of blindness & visual impairment in population aged  $\geq 50$  years (PVA)**

Principal Cause	Blindness (%)	SVI $< 6/60 - 3/60$ (%)	MVI $< 6/18 - 6/60$ (%)	MSVI $< 6/18 - 3/60$ (%)	EVI $< 6/12 - 6/18$ (%)	VI $< 6/18$ (%)
Refractive error	0.1	1.5	18.8	15.8	70.6	13.4
Aphakia uncorrected	1.7	1.4	0.8	0.9	0.6	1.0
Cataract untreated	66.2	80.7	70.2	72.0	23.9	71.2
Cataract surgical complications	7.2	8.3	5.2	5.7	2.9	5.9
Trachomatous corneal opacity	0.8	0.1	0.0	0.1	0.0	0.2
Non trachomatous corneal opacity	7.4	1.7	0.6	0.8	0.3	1.8
Phthisis	2.8	0.1	0.0	0.0	0.0	0.4
Glaucoma	5.5	0.8	0.7	0.8	0.3	1.4
Diabetic retinopathy	1.2	1.1	0.7	0.7	0.3	0.8
ARMD	0.7	0.7	0.8	0.8	0.3	0.8
Other posterior segment disease	5.9	3.4	2.0	2.2	0.7	2.8
All other globe / CNS abnormalities	0.5	0.2	0.2	0.2	0.1	0.3
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

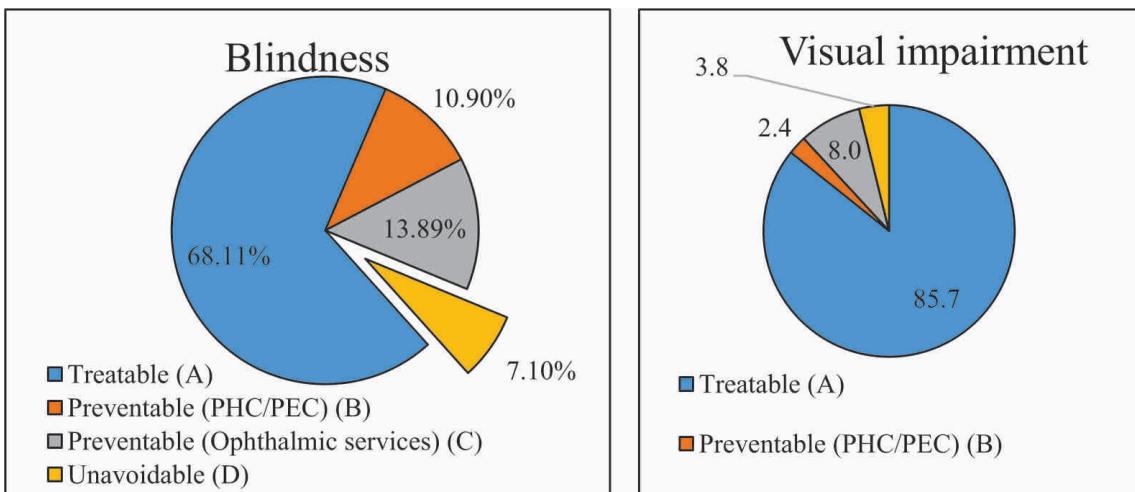


**Figure 6: Causes of blindness (PVA  $< 3/60$  better eye) in population aged  $\geq 50$  years**



**Figure 7: Causes of visual impairment (PVA<6/18 in better eye) in population aged  $\geq 50$  years**

Most of the blindness and visual impairment were due to avoidable causes (92.9% and 96.2% respectively). Among avoidable causes, treatable causes of blindness and VI were 68.1% and 85.7% respectively.



**Figure 8: Categories of blindness and visual impairment by intervention**

#### Prevalence of blindness and visual impairment due to cataract in population aged $\geq 50$ years

In the examined population, the prevalence of blindness due to cataract (pinhole VA<3/60 in better eye with obvious lens opacity both eyes) was 0.84% while prevalence of bilateral cataract visual impairment (pinhole VA<6/18 in better eye) was 5.09%. Prevalence of cataract blind eyes with pinhole VA<3/60 was 3.19% and that visually impaired eyes with pinhole VA<6/18 was 9.84%.

**Table 4: Prevalence of blindness and visual impairment due to cataract in population aged  $\geq 50$  years**

Pinhole vision category-wise cataract	Male (%)	Female (%)	Total (%)
<b>Cataract and Pinhole VA&lt;3/60 in better eye</b>			
Bilateral cataract	0.59	1.09	0.84
Unilateral Cataract	4.12	5.28	4.7
<b>Cataract and Pinhole VA &lt;6/60 in better eye</b>			
Bilateral cataract	1.17	1.88	1.53
Unilateral Cataract	5.45	6.79	6.12

<b>Pinhole vision category-wise cataract</b>	<b>Male (%)</b>	<b>Female (%)</b>	<b>Total (%)</b>
<b>Cataract and pinhole VA &lt;6/18 in better eye</b>			
Bilateral cataract	4.31	5.88	5.09
Unilateral Cataract	10.19	11.39	10.79

#### **Cataract surgical coverage in population aged ≥ 50 years**

Cataract surgical coverage (CSC) among cataract blinds (VA <3/60 in better eye) was 93.2% (males 94.8% and females 91.9%). CSC among visually impaired (VA<6/18 in better eye) due to cataract was 74.0%.

**Table 5: Cataract surgical coverage in population aged ≥ 50 years**

	<b>Males %</b>	<b>Females %</b>	<b>Total %</b>
Cataract Surgical Coverage (Persons) - percentage			
Pinhole VA < 3/60	94.8	91.9	93.2
Pinhole VA < 6/60	90.7	87.7	89.0
Pinhole VA < 6/18	75.6	72.7	74.0

**Table 6: District wise cataract surgical coverage in population aged ≥ 50 years**

<b>District</b>	<b>VA &lt;3/60</b>	<b>VA &lt;6/60</b>	<b>VA &lt;6/18</b>
Jammu	95.9	92.9	81.2
Bilaspur	95.0	92.3	82.5
Kapurthala	98.4	96.3	89.6
Yamuna Nagar	96.0	93.8	85.6
West Delhi	97.0	94.7	84.4
Sikar	91.8	88.6	79.4
Sirohi	92.9	91.0	80.6
Bijnor	94.7	91.0	73.3
Banda	96.5	92.9	84.5
Ambedkar Nagar	90.6	83.0	66.3
Khargone	92.6	87.6	73.4
Guna	85.9	81.6	63.4
Janjgir-Champa	91.1	87.0	64.4
Khera	99.2	98.1	88.7
Thane	94.4	90.2	75.0
Wardha	92.6	87.7	74.8
North Goa	95.9	93.6	80.1
Vaishali	90.0	84.2	66.5
Sitamarhi	91.5	85.2	64.4
Purbi Singhbum	86.1	80.6	56.2
Nayagarh	84.2	75.2	50.8

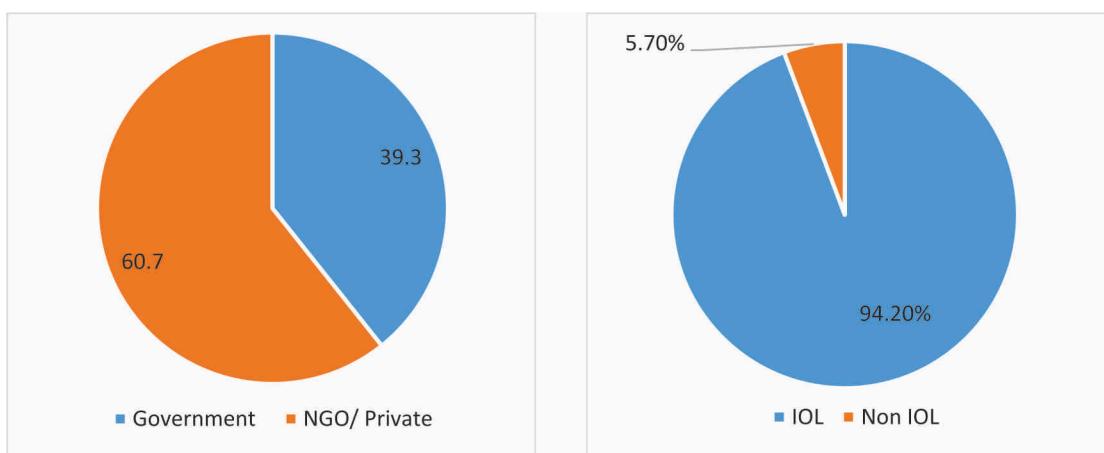
District	VA <3/60	VA <6/60	VA <6/18
Howrah	94.6	91.0	76.9
Birbhum	93.4	87.5	62.7
Warangal	87.3	82.2	68.1
Kadapa	97.0	94.6	84.4
Chikmagalur	92.0	84.8	71.5
Virudhunagar	98.2	95.2	82.9
Thrissur	95.0	92.1	77.3
Nalbari	79.7	72.3	55.6
Thoubal	81.4	78.6	58.2
East Siang	88.4	83.2	58.4
<b>Total</b>	<b>93.2</b>	<b>89.0</b>	<b>74.0</b>

#### Cataract surgery and its outcomes in Population aged $\geq 50$ years

Prevalence of bilateral pseudophakia and/or aphakia was 9.08% while that of pseudophakic/ aphakic eyes was 13.88%. Majority of cataract surgeries took place in Non-Governmental Organizations / Private set-up irrespective of sex (males 58.5% and females 57.2%). Only 39.3% underwent cataract surgery in Government set-up. Out of all the operated eyes, 94.2% of them had intra-ocular lens (IOL) implantation.

**Table 7: Prevalence of Pseudophakia and aphakia in population aged  $\geq 50$  years**

Aphakia/ pseudophakia	Male %	Female %	Total %
Bilateral (Pseudo)aphakia	8.72	9.37	9.08
Unilateral (Pseudo)aphakia	9.31	9.76	9.56
Eyes (Pseudo)aphakia	13.36	14.23	13.88



**Figure: 9: Type & place of cataract surgery in  $\geq 50$  years population**

Based on the presenting visual acuity in the operated eye, it was seen that 57.8% of total operated eyes had very good visual outcome (can see 6/12) and 17.7% had good outcomes (<6/12 to 6/18)), 13.6% had borderline visual outcome (<6/18-6/60) and 10.9% had poor visual outcome (<6/60). IOL surgeries had better outcomes compared to Non IOL surgeries.

When visual outcomes were assessed by best corrected visual acuity (pinhole) in the operated eye, 73.4% of total cataract operated eyes had very good visual outcome (can see 6/12) and 10.5% had good

outcomes (<6/12 to 6/18), 7.6% had borderline visual outcome (<6/18-6/60) and 8.5% had poor visual outcome (<6/60).

**Table 8: Visual Outcomes by type of cataract surgery (eyes) in population aged ≥ 50 years**

	Presenting visual acuity (PVA)			Best corrected visual acuity (BCVA)		
	Non-IOL %	IOL %	Total %	Non-IOL %	IOL %	Total %
Very good: can see 6/12	15.3	60.3	57.8	26.2	76.3	73.4
Good <6/12-6/18	13.6	18.0	17.7	19.3	9.9	10.5
Borderline <6/18-6/60	18.1	13.3	13.6	17.5	7.0	7.6
Poor <6/60	53.0	8.4	10.9	37.1	6.8	8.5

Most important reasons for poor outcome (<6/60) of cataract surgery in terms of visual acuity were other ocular co-morbidities (41.4%) and operative complications (31.2%). Borderline visual outcome (<6/18-6/60) after cataract surgery was due to operative complications (33.9%) and refractive error (25.9%).

**Table 9: Cause of PVA<6/18 (borderline and poor outcome) after cataract surgery in surveyed districts in population aged ≥ 50 years**

	Ocular comorbidity	Operative complications	Refractive error	Long term complications
	%	%	%	%
Borderline <6/18-6/60	20.3	33.9	25.9	19.9
Poor <6/60	41.4	31.2	8.8	18.7

### Barriers in accessing cataract surgical services in population aged ≥ 50 years

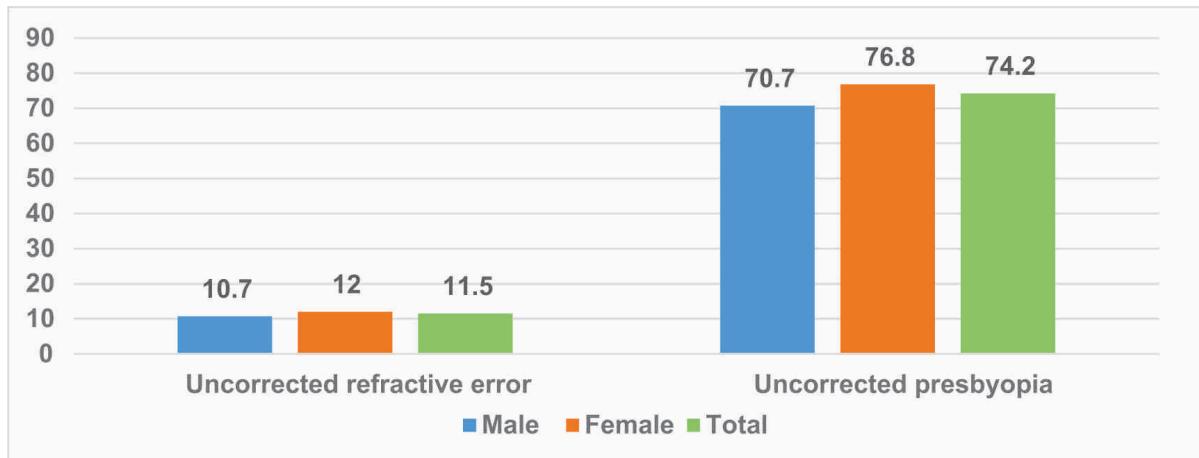
Among those people who were identified to have pinhole visual acuity <3/60 and having bilateral cataract, most commonly reported barriers were local reasons (25.5%, including no one to accompany, seasonal preferences, personal reasons). Other important barriers were financial constraints (22.1%), need for surgery not felt (18.4%) and fear of surgery (16.1%). Among males, the most important barriers were financial constraints (31.0%) and local reasons (21.5%). Among females, local reasons (23.1%) and financial constraints (21.2%) were most important barriers.

**Table 10: Barriers to cataract surgery in pinhole VA<3/60 due to cataract in population aged ≥ 50 years**

	Males %	Females %	Total %
Need not felt	15.1	19.0	18.4
Fear	12.4	16.3	16.0
Cost	31.0	21.2	22.1
Treatment denied by provider (including systemic comorbidities)	4.8	11.2	7.9
Unaware treatment is possible	0.8	2.8	2.1
Cannot access treatment	8.1	6.4	7.9
Local reasons (seasonal preferences, personal reasons, no one to accompany)	21.5	23.1	25.5

## Prevalence of uncorrected refractive error and presbyopia in population aged $\geq 50$ years

Out of all the individuals examined, 11.5% had uncorrected refractive error and 74.2% had uncorrected presbyopia.



**Figure 10: Uncorrected RE and uncorrected presbyopia prevalence in population aged  $\geq 50$  years**

## Survey in aged 0-49 years population

### Prevalence of blindness and visual impairment

Out of enumerated 18000 participants across six districts, 15203 (84.5%) were examined. The response rate was maximum in the 0-15 year age group (91.3%). The prevalence of visual impairment was 4.43 per thousand and blindness was 0.52 per thousand in the 0-49 year age group.

**Table 11: Prevalence of blindness and visual impairment in population aged 0-49 years**

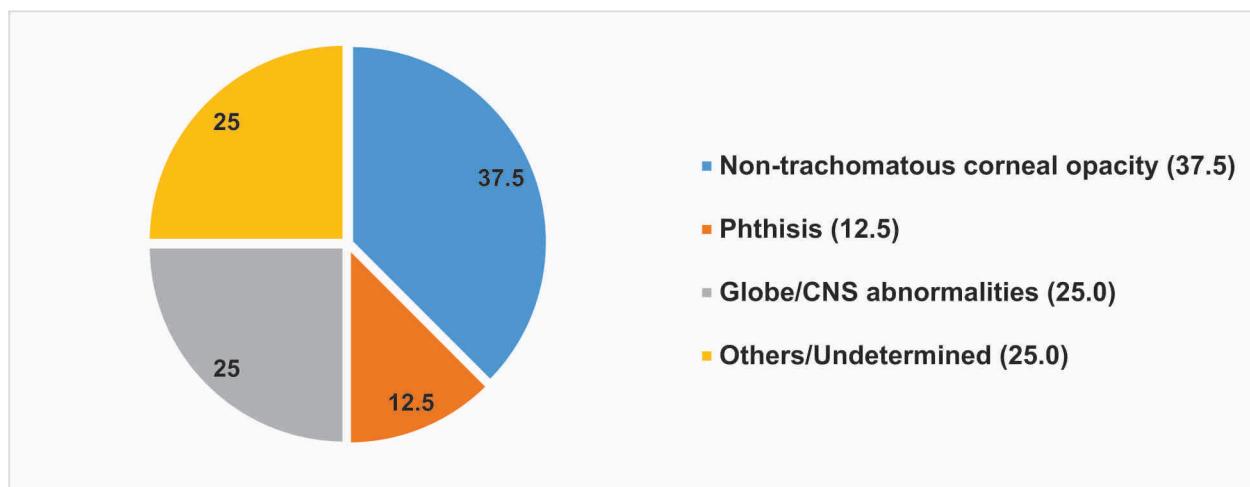
Indicator (based on better eye visual acuity)	Male (per 1000)	Female (per 1000)	Total (per 1000)
Blindness (PVA <3/60)	0.43	0.62	0.52
SVI (PVA <6/60-3/60)	0.30	0.67	0.48
MVI (PVA <6/18-6/60)	2.73	3.96	3.33
EVI (PVA <6/12-6/18)	8.67	11.98	10.28
MSVI (PVA <6/18-3/60)	3.03	4.63	3.81
VI (PVA <6/18)	3.46	5.25	4.33
Functional low vision (FLV)	0.40	1.00	0.52
Pinhole blindness (<3/60)	0.43	0.62	0.52

### Causes of blindness and visual impairment in population aged 0-49 years

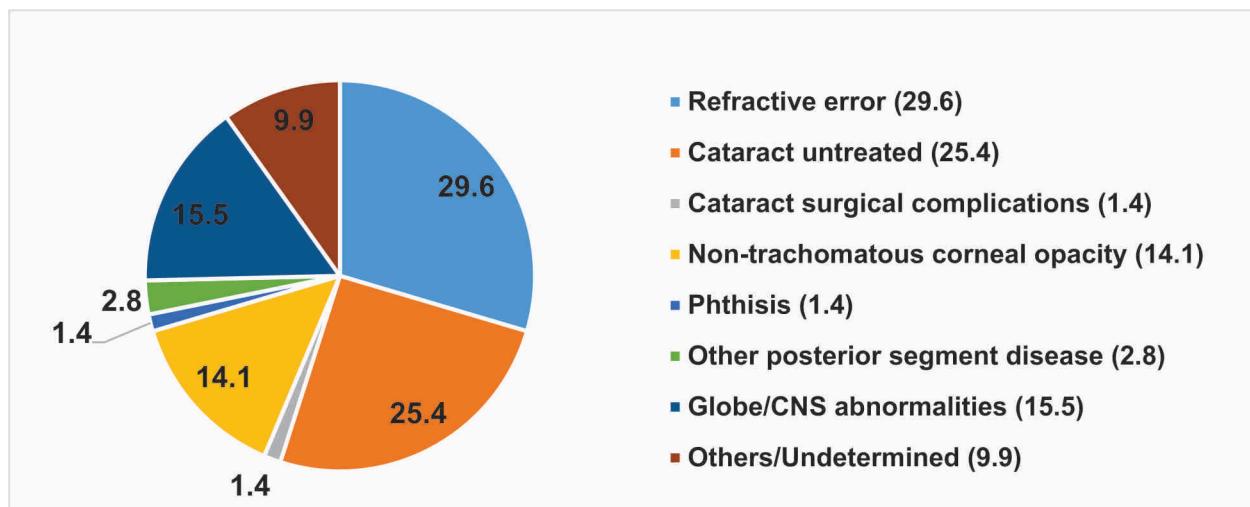
Majority cases of blindness were due to non-trachomatous corneal blindness (37.5%). Most important causes of VI were refractive error (29.6%), untreated cataract (25.4%), all globe/ CNS abnormality (15.5%), and non-trachomatous corneal opacity (14.1%).

**Table 12: Causes of blindness and visual impairment in population aged 0-49 years**

Principal Cause	Blindness	SVI	MVI	MSVI	EVI	VI
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Refractive error	0 (0.0)	0 (0.0)	21 (38.2)	21 (33.3)	149 (88.7)	21 (29.6)
Cataract untreated	0 (0.0)	1 (12.5)	17 (30.9)	18 (28.6)	9 (5.4)	18 (25.4)
Cataract surgical complications	0 (0.0)	1 (12.5)	0 (0.0)	1 (1.6)	0 (0.0)	1 (1.4)
Non-trachomatous corneal opacity	3 (37.5)	2 (25.0)	5 (9.1)	7 (11.1)	0 (0.0)	10 (14.1)
Phthisis	1 (12.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.4)
Other posterior segment disease	0 (0.0)	0 (0.0)	2 (3.6)	2 (3.2)	1 (0.6)	2 (2.8)
Globe/CNS abnormalities	2 (25.0)	3 (37.5)	6 (10.9)	9 (14.3)	3 (1.8)	11 (15.5)
Others/Undetermined	2 (25.0)	1 (12.5)	4 (7.3)	5 (7.9)	6 (3.6)	7 (9.9)
<b>Total</b>	<b>8 (100)</b>	<b>8 (100)</b>	<b>55 (100)</b>	<b>63 (100)</b>	<b>168 (100)</b>	<b>71 (100)</b>



**Figure 11: Causes of blindness (PVA<3/60 better eye) in population aged 0-49 years**



**Figure 12: Causes of visual impairment (PVA <6/18 better eye) in population aged 0-49 years**

### Prevalence of blindness and visual impairment in overall population

Estimated prevalence in overall population of blindness was 0.36%, severe visual impairment was 0.35%, moderate visual impairment was 1.84%, early visual impairment was 2.92%. Estimated moderate severe visual impairment in overall population was 2.19% and that of visual impairment was 2.55%. Estimated prevalence of pinhole blindness in overall population of India was 0.32%.

**Table 13: Estimated prevalence of blindness and visual impairment in overall population**

Category of Blindness & visual impairment (based on better eye VA)	0-49 years	≥ 50 years	Overall Population
	Prevalence %	Prevalence %	Prevalence %
Blindness (PVA<3/60)	0.052	1.99	0.36
SVI (PVA<6/60-3/60)	0.048	1.96	0.35
MVI (PVA <6/18-6/60)	0.333	9.81	1.84
EVI (PVA <6/12-6/18)	1.028	12.92	2.92
MSVI (PVA <6/18-3/60)	0.381	11.77	2.19
VI (PVA<6/18)	0.433	13.76	2.55
Blindness (BCVA/Pinhole <3/60)	0.052	1.75	0.32

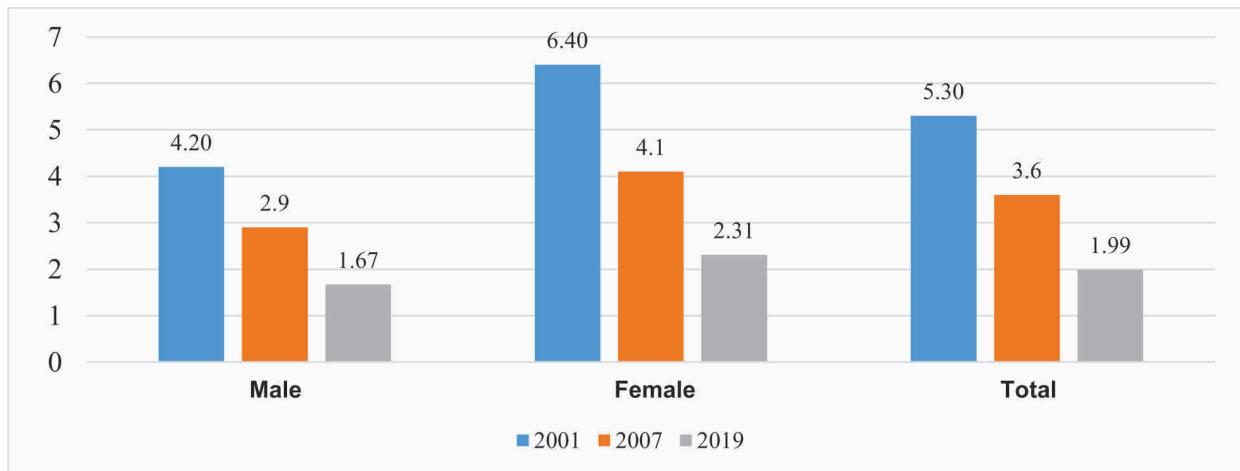
**Table 14: Extrapolated number of blind and visually impaired in overall population of India 2017**

Category of Blindness & visual impairment (based on better eye VA)	0-49 years N=1119183644	≥50 years N=211924583	Total Population N=1331108227
Blindness (PVA<3/60)	581975	4217299	4799274
SVI (PVA<6/60-3/60)	537208	4153722	4690930
MVI (PVA <6/18-6/60)	3726882	20789802	24516684
EVI (PVA <6/12-6/18)	11505208	27380656	38885864
MSVI (PVA <6/18-3/60)	4264090	24943523	29207613
VI (PVA<6/18)	4846065	29160823	34006888
Blindness (BCVA/Pinhole <3/60)	581975	3708680	4290655

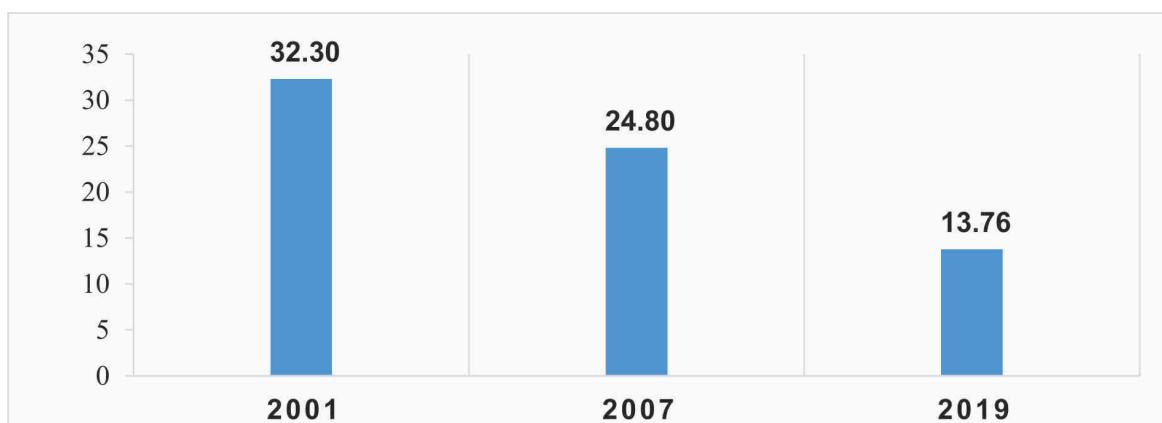
### Trends of blindness and visual impairment over the years in population aged ≥ 50 years

Over the years, the prevalence of blindness among ≥ 50 population has reduced considerably. Blindness, as defined by presenting visual acuity <3/60 in better eye, has reduced from 5.3% in 2001 to 3.60% in 2007 to 1.99% in current survey. Visual impairment has reduced from 32.3% in 2001 to 24.8% in 2007 to 13.73% in current survey in ≥ 50 population.

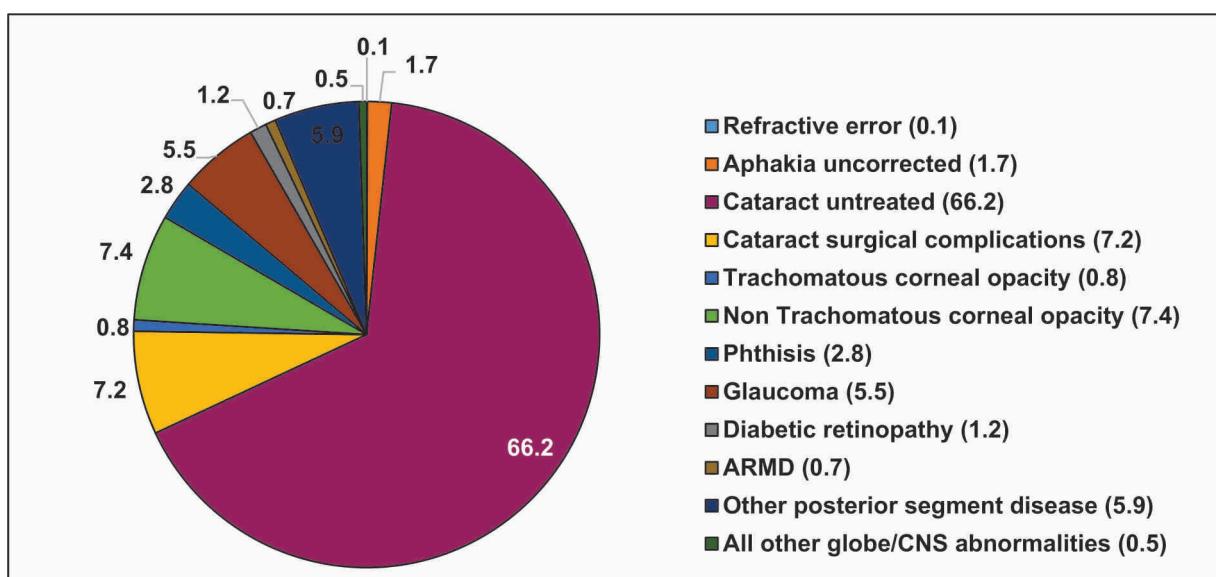
Cataract continue to be the major cause of blindness and responsible for 66.2% of blindness. Refractive error was the most important cause of visual impairment and second important cause of blindness in 2001 but the current survey showed that refractive error is not an important cause of blindness. Corneal blindness emerged as the second important cause of blindness. Beside this, the proportion of blindness due to complications of cataract surgery have also increased.



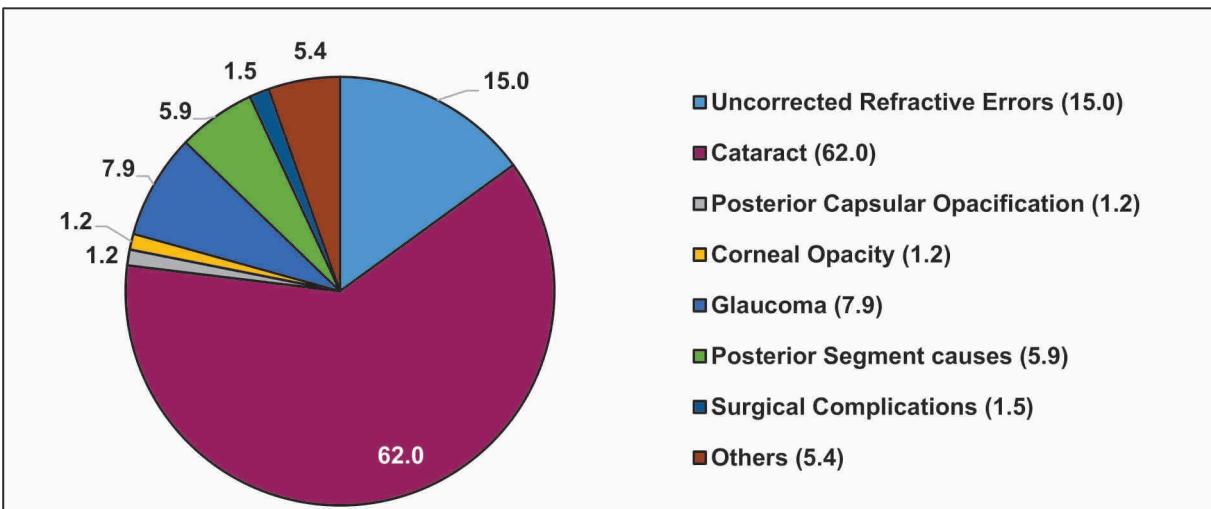
**Figure 13:** Trends in prevalence of blindness (PVA <3/60 in better eye) over the years in population aged  $\geq 50$  years



**Figure 14:** Trends in prevalence of visual impairment (PVA <6/18 in better eye) over the years in population aged  $\geq 50$  years



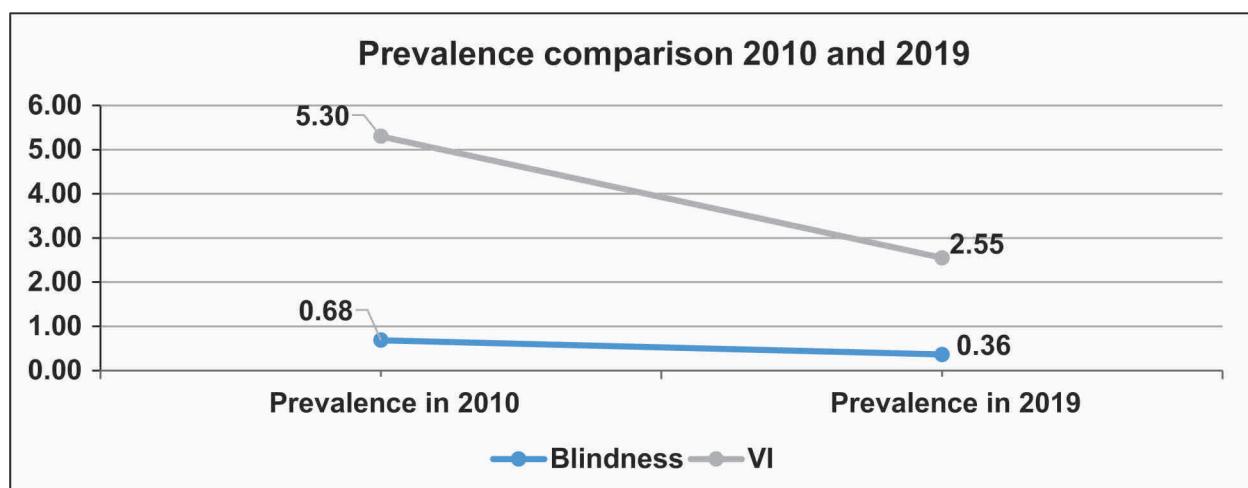
**Figure 15:** Causes of blindness (PVA <3/60 in better eye) in 2019 in population aged  $\geq 50$  years



**Figure 16: Causes of blindness (PVA better eye <3/60) in 2001 in population aged  $\geq 50$  years**

#### Reduction in blindness, moderate severe visual impairment and visual impairment from 2010 estimates

The WHO Global Action Plan for Universal Eye Health 2014-2019 targets a reduction in the prevalence of visual impairment by 25% by 2019 from the baseline level of 2010. The WHO estimated a prevalence of blindness, MSVI and VI as 0.68%, 4.62% and 5.30% respectively in India for the year 2010. The current survey shows a reduction of 47.1% in blindness, 52.6% in MSVI and 51.9% in VI compared to the baseline levels. **This shows that the target of 25% reduction in visual impairment have been achieved successfully by India.**



**Figure 17: Reduction in blindness, moderate severe visual impairment and visual impairment from 2010 estimates in overall population**

**Table 15: List of Districts where surveys were conducted**

State	District	RAAB Survey ( $\geq 50$ year)	0-49 year survey	State	District	RAAB Survey ( $\geq 50$ year)	0-49 year survey
Andhra Pradesh	Kadapa	✓		Manipur	Thoubal	✓	✓
Telangana	Warangal	✓		NCT of Delhi	West Delhi	✓	✓

State	District	RAAB Survey ( $\geq 50$ year)	0-49 year survey	State	District	RAAB Survey ( $\geq 50$ year)	0-49 year survey
Assam	Nalbari	✓		Odisha	Nayagarh	✓	
Bihar	Sitamarhi	✓		Punjab	Kapurthala	✓	
	Vaishali	✓	✓	Chhattisgarh	Janjgir-Champa	✓	
Madhya Pradesh	Guna	✓		Goa	North Goa	✓	
	Khargone	✓		Gujarat	Kheda	✓	✓
Maharashtra	Thane	✓		Haryana	Yamunanagar	✓	
	Wardha	✓		Himachal Pradesh	Bilaspur	✓	
Rajasthan	Sikar	✓		Jammu & Kashmir	Jammu	✓	
	Sirohi	✓		Jharkhand	Purbi Singhbhum	✓	
Uttar Pradesh	Ambedkar Nagar	✓		Karnataka	Chikmagalur	✓	
	Banda	✓	✓	Kerala	Thrissur	✓	
	Bijnor	✓		Tamil Nadu	Virudhunagar	✓	✓
West Bengal	Birbhum	✓		Arunachal Pradesh	East Siang	✓	
	Howrah	✓					

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