



**National Program for
Control of Blindness**

Rapid Assessment of Avoidable Blindness- INDIA

Report

2006-2007

**Directorate General of Health Services
Ministry of Health and Family Welfare
Government of India
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1. BACKGROUND

India is the first country to have launched a National Program for Control of Blindness. Due to the increasing prevalence of cataract related blindness, in 1994, the World Bank provided a soft loan to the Government of India for the implementation of the Cataract Blindness Control Program in the seven States in the country which had the highest prevalence of cataract blindness. The program turned out to be one of the most cost effective health interventions ever supported by the World Bank.

In 1999-2000, the WHO and the IAPB (the umbrella organization for all the international eye NGO's) embarked on a global initiative to eliminate avoidable blindness, globally by 2020. India is committed to realization of the goal of Vision2020: The Right to Sight.

India has a strong tradition of evidence based practice in eye care. Over the past three decades, the implementation of activities under the National Program have been guided by a series of population based surveys. Results of the various surveys have helped in identification of need-based strategies which is one of the reasons for the success of the National Program for Control of Blindness. India is also the first country in the world to have identified a rapid assessment technique for blindness/ cataract blindness. The technique has been widely used in many countries over the last decade. Modifications in the initial methodology were incorporated to improve the technique.

Rapid Assessment of Blindness and Cataract Surgical Services (RACSS) is a simple survey technique to assess the prevalence of blindness, surgical coverage of cataract blind and visual outcomes following cataract surgery. This has found universal acceptance with locally relevant modifications.

Due to the cost involved in conducting detailed surveys for blindness in the country and the rigorous methods that are needed for such surveys, the country has used rapid assessment of blindness to document changes in the prevalence of blindness in India. The first set of rapid assessment for blindness was carried out in 1994 in Karnataka where all the districts in the State were covered. This was followed by similar assessments being carried out in all districts in Gujarat in 1996. The Government of India initiated rapid assessments in the 7 World Bank Assisted States for the first time in 1998. This was quickly followed by a second round of rapid surveys in other States also in 2002 and 2004. During the period 1999-2001, detailed surveys were carried out in 15 States in the country. All these studies provided accurate estimates of the blindness situation in India.

Recently efforts have been made to develop rapid methods for assessment of avoidable blindness. In addition, modified detailed surveys have also been commissioned in Gujarat. In view of the global initiative for the elimination of avoidable blindness, it is imperative that surveys should document the status in the country in relation to the avoidable causes of blindness.

The present set of rapid surveys will therefore concentrate on avoidable blindness. For this purpose a modified RAAB protocol has been developed, tailored to the needs of the country. It is proposed to conduct the surveys in 16 districts where blindness surveys were earlier undertaken over the period 1998-2001. This will enable comparison of trends in the prevalence of blindness in the same population and will be a good indicator of the impact of the blindness control activities in the country.

2. METHODOLOGY

2.1 OBJECTIVES

1. To assess the prevalence of blindness among the 50+ population in India
2. To assess the proportion of avoidable to total blindness in 50+ population
3. To ascertain trends in the prevalence of blindness among 50+ over the past five years
4. To estimate the prevalence of blindness in the general population in India
5. To identify the major causes of blindness and avoidable blindness in India
6. To document the surgical trends in India
7. To ascertain the visual outcomes after cataract surgery
8. To estimate the cataract surgical rate in different States
9. To study the barriers to cataract surgery
10. To assess the Cataract Surgical Coverage
11. To assess the effect of socio-demographic factors on the prevalence of blindness.
12. To estimate the total number of blind in India in 2006
13. To identify future strategies for successful implementation of Vision2020 objectives.

2.1.2 EXPECTED OUTCOME

1. Identify the trends in blindness, cataract blindness and avoidable blindness in India over the past five years.
2. Information will help to document what has happened in the country after World Bank assisted Cataract Blindness Control Project ended.
3. Provide information on the future support required from Govt. of India and INGO's for blindness control.
4. Assess the current situation and status with regard to progress towards Vision2020

2.2 SAMPLING STRATEGY

2.2.1 SAMPLING FRAME

1. Stratified cluster random sampling used
2. Two strata – Urban and Rural
3. Separate sampling frame for urban and rural areas.
4. In each district, 80% (20) clusters from rural areas and 20% (5) from urban areas

2.2.2 SAMPLE SIZE

- | | |
|-------------------------------------|---|
| ❖ Prevalence of blindness | : As per 2001- 02 Survey |
| ❖ Prevalence of avoidable blindness | : 8.0% (Assuming 80% of all blindness is due to avoidable causes) |
| ❖ Power | : 80% |
| ❖ Relative précision | : 20% |
| ❖ Confidence Level | : 95% |
| ❖ Design effect | : 2 |

The sample size for each district was 2500 subjects aged 50 years and above. A total of 25 clusters (20 rural and 5 urban) will be covered in each district. 100 individuals aged 50+ will be examined in each cluster.

Villages with a population less than 1000 have been clubbed together to yield a cluster where 100 individuals aged 50+ will be available. This was keeping in view that the proportion of population aged 50+ was estimated to be 13% in the 2001 census. The estimated population in 2006 was derived by adding 10% to the population in 2001 (assuming an annual growth rate of approximately 2%).

2.3 SURVEY DESIGN

The survey was undertaken in 16 districts where blindness surveys were earlier undertaken over the period 1998- 2001. This enabled comparison of trends in the prevalence of blindness in the same population and was a good indicator of the impact of the blindness control activities in the country. Since the survey concentrated on avoidable blindness, a modified protocol for Rapid Assessment of Avoidable Blindness (RAAB) have been developed (Annexure- I).

2.4 SURVEY TEAMS

The rapid survey for avoidable blindness were carried out in the following States/ districts by the identified survey teams. All survey teams covered one district in each state 15 states, except in UP were two districts were covered because of its populous.

The following criteria were adopted to identify the survey teams:

- a) Experience of having conducted similar surveys on blindness or eye diseases.
- b) Availability of adequate resources for conducting surveys, which requires identifying blind persons on the basis of visual acuity & identifying causes of blindness.
- c) Have access to epidemiologist and ophthalmologist to monitor and support the survey.

All the survey teams were contacted prior to the sampling process and taken consensus to participate in survey. A workshop on training of survey methodology and guidelines for conducting survey was conducted by the NPCB in Dr. R. P. Centre for Ophthalmic Sciences.

| S. No. | Team | State | District |
|--------|---|----------------|-----------|
| 1 | Sarojini Devi Eye Hospital (RIO), Hyderabad | Andhra Pradesh | Prakasam |
| 2 | Sadguru Seva Sangh, Chitrakoot, Satna, MP | Madhya Pradesh | Shadol |
| 3 | H.V.Desai Eye Hospital, Pune | Maharashtra | Parbhani |
| 4 | JPM Rotary Eye Hospital, Cuttack | Orissa | Ganjam |
| 5 | Venu Eye Hospital, Delhi | Rajasthan | Nagaur |
| 6 | Aravind Eye Hospital, Pondicherry | Tamilnadu | Cuddalore |
| 7 | Dr. R. P. Centre for Ophthalmic Sciences, Delhi | Uttar Pradesh | Jhansi |

| | | | |
|----|---|------------------|---------------|
| 8 | Bangalore West Lion's Eye Hospital, Bangalore | Karnataka | Gulbarga |
| 9 | Netra Nirmay Niketan, Vivekanand Mission Hospital, Haldia | West Bengal | Malda |
| 10 | Sewa Rural Bharuch | Gujarat | Surendranagar |
| 11 | Shroff Charitable Eye Hospital, Delhi | Bihar | Vaishali |
| 12 | St Stephens Hospital, Delhi | Punjab | Bhatinda |
| 13 | Christian Medical College, Ludhiana | Himachal Pradesh | Solan |
| 14 | Sankara Eye Hospital, Coimbatore | Kerala | Palakkad |
| 15 | MGIMS, Sevagram | Chhattisgarh | Rajnandgoan |
| 16 | State Institute of Ophthalmology, Allahabad | Uttar Pradesh | Deoria |

Each District Team comprised of the following personnel:

| | | | |
|-----|-----------------------------------|-----------------------------------|---|
| (a) | District Coordination Team: | Chief Medical Officer (CMO) | 1 |
| | | District Ophthalmic Surgeon (DOS) | 1 |
| | | District Programme Manager (DPM) | 1 |
| (b) | Survey Organization (Supervisors) | Chief Investigator | 1 |
| | | Epidemiologist | 1 |
| | | Ophthalmologist | 2 |
| (c) | Survey Team | Ophthalmic Assistants | 2 |
| | | Field Supervisors | 2 |
| | | Field Investigators | 4 |
| | | Data Entry Operator | 1 |
| | | Volunteer | 1 |

2.5 SURVEY SCHEDULE AND DATA MANAGEMENT

The survey was conducted between November 2006- April 2007. All the survey data were fed on computer by the survey team in a dedicated schedule made in MS-Access and analysed using STATA (ver. 9.0). A copy of the data and the physical forms were then sent to Dr. R. P. Centre, New Delhi for analysis and interpretation.

2.6 INSTRUCTIONS FOR THE SURVEY TEAMS

A. Responsibilities of the Ophthalmologist & Epidemiologist:

- Operational planning for the survey in the allocated clusters in consultation with the Chief Medical Officer (CMO), District Ophthalmic Surgeon (DOS), District Programme Manager (DPM) etc.
- Training of the Field Supervisor & Ophthalmic Assistants (OA) on procedure for carrying out the survey.
- Field training of the survey team on selection of the first household in the cluster to be surveyed; filling up performa and cross-checking a 10% sample of those recorded as normal vision by the OA to ensure quality of data.

4. Supervision of the survey work in the selected clusters and accompanying the OA in the house-to-house visit.
5. Making sure that all the 25 selected 'clusters' in each district have been surveyed and dispatching all the 25 survey books along with the data base to RP Centre for data analysis.
6. Managing unforeseen problems encountered during the field-work.
7. Maintaining close liaison with the Programme Office (NPCB), New Delhi for any major alteration/decision required.
8. The ophthalmologist will examine all individuals with vision < 6/18 and record all relevant findings.
9. The epidemiologist will liaise with the community, select the segment for the survey, identify the central location for clinical examination, ensure that all identified personnel reach the examination site and verify all records before leaving the village, in addition to all the other responsibilities stated above.

The other responsibilities to be handled by the epidemiologist include:

10. Preparing day-wise schedule for carrying out the survey in the selected clusters and arranging the vehicles for the survey teams
11. Organizing materials required for the survey - books, 'E' charts, measuring tapes, torch, batteries, patient referral slips, pencils/erasers and hard board.
12. Providing advance information to the residents in the selected clusters through the Local Health Worker to ensure better coverage of the eligible persons.

B. Responsibilities of the Field Supervisors:

1. Participation in training programme organized by Surveyors on procedure.
2. Identification of first household in the selected cluster.
3. Supervision of the survey work in the selected clusters.
4. Making sure that all the 100 persons above the age of 50 years have been covered by the survey team.
5. Ensuring that quality and reliability of information collected is maintained by the survey teams.
6. Managing unforeseen problems encountered during the field-work.

C. Responsibilities of the Ophthalmic Assistants:

1. Participating in the training programme organized by Chief Surveyors covering the methodology of the survey, filling up the performa and procedures for visual acuity testing.
2. Carrying out the actual survey in the selected clusters under the supervision of the Field Supervisor/Chief Surveyors.
3. Following the instructions and guidelines given by the Field Supervisor and starting the survey once the first household has been selected by him/her. This includes confirmation of the age of the person to be included, carrying out the visual acuity testing using simplified 'ETDRS' chart & measuring tape and filling up the performa.
4. Completing the survey in the allotted cluster by covering 100 persons aged 50+ with the assistance of the local helpers.

D. Responsibilities of Survey Assistants (local Health Worker or volunteer):

1. Visiting all the households and introducing the OA to the family members.
2. Identifying individuals aged 50+.
3. Helping vision testing by explaining the procedure to the person, by holding the measuring-tape and covering the other eye while one is being examined.

3. RESULTS

3.1 Basic Demographic Characteristics of Survey Population

The rapid assessment of avoidable blindness covered 16 districts, from 15 of the most populated States in India, over the period Nov 2006- Mar 2007. 11 of these districts were covered under the detailed national level blindness survey in 2001 and another 5 were covered under the Rapid Assessment in 1998. One district was covered in 1998, 2001 and again in 2007.

Overall 42722 individuals aged 50 or more years were enumerated across the country, of whom 40447 (94.7%) were examined. The response rate was above 85% in all districts of which 8 had response rate above 95% (Table 1).

Amongst the enumerated, 54.5% were females while 55.1% of the examined were females (Table 2). Only in three districts (Bhatinda, Solan and Vaishali) males outnumbered females among the enumerated as well as among the examined.

Amongst the enumerated, a fifth of all respondents were aged 50-54 years, 55-59 years and 60-64 years (22.8%, 21.5% and 20.6% respectively) (Table 3). 44.6% of the examined were aged 50-59 years (Table 4). In Ganjam and Parbhani districts, less individuals were enumerated and examined at the younger ages (50-59 years) compared to the other age groups.

The mean age of the respondents was 61.5 years (Range: 50-110) across the country. The mean age of male respondents was 62.4 years compared to 60.9 years amongst the females. The mean age of respondents was lowest in Shahdol district (59.7 years) in Madhya Pradesh while the highest was 63.9 years in Ganjam district in Orissa.

Amongst the enumerated, 35.2% were working and earning an income while 18% had no work (Table 5). Proportion not working was highest in Ganjam (26.9%) and the lowest in Shahdol (8.7%).

3.2 Visual Acuity and Prevalence of Blindness

Based on bilateral presenting vision, 68.8% of the examined individuals could be categorized as having 'normal' vision ($> 6/18$ in both eyes) (Table 6). The proportion of 'normal' category was highest in Palakkad (84.9%) while the lowest was in Rajnandgaon (53.1%).

The prevalence of low vision ($< 6/18 - 6/60$ in the better eye) was 16.8% based on presenting vision. This varied from a low of 6.7% in Palakkad to a high of 30.8% in Rajnandgaon.

The prevalence of economic blindness (Vision < 6/60 – 3/60 in the better eye) was 4.4% pooling data from all districts together with a low of 2% in Bhatinda to a high of 9.2% in Deoria.

The prevalence of social blindness (vision < 3/60 in the better eye) was 3.6% across all districts with a low of 1% in Palakkad and a high of 7.8% in Ganjam district. This level of blindness corresponds to the WHO definition of blindness based on presenting vision.

The prevalence of one-eye blind (vision < 6/60 in one eye and better than 6/18 in the fellow eye) was 6.4%, with a low of 3% in Rajnandgaon and a high of 10% in Nagaur.

The vision of all individuals was also tested with a pinhole if their presenting vision was less than 6/18 in any eye. The proportion of individuals who could be categorized as normal increased to 77.9% (Table 7). The prevalence of low vision, economic blindness, social blindness and one-eye blindness were 9.5%, 2.9%, 3% and 6.8% respectively.

The National Program for Control of Blindness defines individuals with a vision less than 6/60 in the better eye as blind. Using this cut off, the prevalence of blindness was observed to be 8.0% among the 50+ population across the country, based on presenting vision (Table 8). Using pinhole vision, the prevalence of blindness was 5.9%. The lowest prevalences based on presenting vision were observed in Solan (3.2%), Palakkad (3.7%) and Bhatinda (4.4%). The highest prevalence was observed in Rajnandgaon (13.2%), Deoria (12.4%) and Parbhani(11.3%). The lowest prevalence using pinhole vision was in Palakkad (2.7%) and the highest was in Ganjam (9%).

3.2.1 Association of Blindness with Gender

Using the NPCB cut-off, based on presenting vision, the prevalence of blindness among women was 1.34 times higher compared to men. The prevalence of blindness among males was 6.6% and among females it was 9.2% (Table 9). The trend of higher prevalence among females was observed in all districts. Based on pinhole vision, the prevalence of blindness was 4.9% among males and 6.7% among females (Table 10).

3.2.2. Association of Blindness with Age

It was observed that the prevalence of blindness (vision < 6/60 in the better eye) based on presenting vision increased with increasing age. The prevalence was 1.3% at 50-54 years of age and increased to 20.6 above the age of 70 years which is a 16 fold increase (Table 11). The prevalence at 50-54 years was lowest in Solan (0.1%) while above the age of 70 years, the prevalence was the highest in Rajnandgaon (38.7%).

With pinhole, the prevalence in the age group of 50-54 years was 0.8% while it was 16.2% above the age of 70 years (Table 12).

3.3 Cataract Surgical Coverage

3.3.1 Surgical Coverage (Persons)

The cataract surgical coverage among persons was calculated as follows:

$$\text{Coverage (Persons)} = \frac{\text{No. of persons operated in one/both eyes}}{\text{No. of persons operated} + \text{No. of unoperated cataract blind persons}} \times 100$$

The cataract surgical rates was calculated separately for cataract blind persons with vision < 3/60 in the better eye and for persons with vision < 6/60 in the better eye.

Using < 3/60 to define the cataract blind persons, 82.3% of persons needing cataract surgery were covered by surgery (Table 13) while using < 6/60 to define the cataract blind, 66% of persons had one or both eyes operated. It is well known that the definition of the cataract blind influences surgical coverage rates. The coverage rates were low in Ganjam and Vaishali where only half the persons needing cataract surgery had access to surgery compared to districts like Bhatinda, Cuddalore, Palakkad, Solan and Surndranagar where more than 90% of those blind due to cataract (vision < 3/60 in the better eye) had been operated in at least one eye.

3.3.2 Surgical Coverage (Eyes)

The cataract surgical coverage for individual eyes was calculated as follows:

$$\text{Coverage (Persons)} = \frac{\text{Eyes operated for cataract}}{\text{Operated eyes} + \text{Unoperated cataract blind eyes}} \times 100$$

The coverage was 62.9% using < 3/60 to define cataract blindness and 47.7% using < 6/60 to define cataract blindness (Table 14). These results show that a significant proportion of the cataract blind in the country still get operated at a vision worse than 3/60 in the affected eye.

3.4 Profile of Cataract Operated Individuals

A total of 7296 cataract surgeries were reported from the 16 districts (Table 15). 901 cataract surgeries (12.3% of all districts) were reported from Cuddalore, while 787 (10.8%) were reported from Surendranagar and 683 (9.4%) were reported from Prakasam district. Thus a third of all surgeries (32.5%) were from just three districts in the 16 districts. Malda, Shahdol and Deoria reported the least surgeries. More females reported surgery (4192) compared to males(3104) and more surgeries were reported in the last 5 years(4582) which was responsible for 62.8% of all surgeries reported. As mortality increases with age, it is logical that most surgeries would be reported by survivors (the most recently operated).

The proportion of surgeries with an IOL implant was 63.6% (Table 16). The proportion of IOL surgery was highest in Palakkad district (83.4%) and lowest in Jhansi district (36.1%). It was observed that districts with access to NGO hospitals and private surgeons reported higher proportion of IOL surgeries.

The IOL surgery rate was only 11.4% in surgeries reported before 1997 compared to 82.2% among surgeries in the last 5 years (Table 17). In Palakkad and Surendranagar, more than 90% of surgeries in the recent five years were IOL surgeries.

Amongst the males, 66.3% surgeries were done with an IOL implant compared to 61.6% among the females. The male-female differentials were significant in some districts like Palakkad and Bhatinda (Table 18).

3.5 Visual Outcome after Surgery

Visual acuity after surgery was analyzed separately for non IOL and IOL surgery. When no IOL was used, 31.5% had a vision better than 6/18 in the operated eye while 30.6% had vision less than 3/60 (Table 19). In Ganjam district, 59% of surgeries resulted in a vision less than 3/60 in the operated eye. Based on presenting vision, one third to half the operated eyes had vision less than 6/60 in the operated eye.

With IOL surgery, 89.5% had vision better than 6/60 in the operated eye while only 5.4% had vision less than 3/60 (Table 20). There was significant difference in visual outcome after IOL surgery compared to non-IOL surgery, in all districts surveyed.

3.5.1 Spectacle Usage After Cataract Surgery

Amongst operated persons, 59.3% were not using spectacles at the time of the examination (Table 21). The proportion not using spectacles currently was higher in some districts like Cuddalore, Ganjam, Rajnandgaon, Surendranagar and Shahdol where more than 70% were not using spectacles.

The condition of spectacles that were used currently varied widely across the districts (Table 22). Overall only half the aphakic spectacles and a third of spectacles used after IOL surgery were found to be of good quality.

3.5.2 Payment for Cataract Surgery

It was observed that 78% of the non-IOL and 58.1% of the IOL surgery was provided at no cost to the client (Table 23). In Prakasam district, 59.4% of non-IOL surgeries, were paid for, by the clients. A higher proportion paid for IOL surgery compared to non-IOL surgery.

3.5.3 Place of Surgery

The proportion of cataract surgeries performed in make shift camps or outreach locations has decreased over the last five years (Table 24). Over the period 2002-2007, only 14.6% surgeries were performed in such locations. About a quarter of all surgeries were performed at private facilities while another quarter were at Government facilities. The largest provider of surgical services was the NGO sector. In Ganjam, Parbhani and Shahdol districts, even in recent years, the government sector was the most prominent while in Cuddalore, Palakkad, Surendranagar and Rajnandgaon, the NGO sector was the predominant partner. In Bhatinda, Gulbarga, Prakasam and Vaishali, the private surgeons were the predominant source for cataract surgery.

In Cuddalore, only 2.8% went to private facilities.

3.5.4 Causes of Blindness and Visual Impairment

Cataract continues to be the single largest cause of bilateral blindness in India (Table 25). Among all the blind, 77.5% were blind due to cataract. Uncorrected aphakia was responsible for 4.6% of blindness. Trachoma and other corneal scarring was responsible for 3.9% of blindness, uncorrected refractive errors for 3.4% and glaucoma for 3%. Posterior segment pathology was responsible for 2.8% of all bilateral blindness. There was no district in the country where cataract was not responsible for more than half the blindness.

When causes of low vision were analyzed, it was observed that cataract was responsible for 58.1% of low vision (vision < 6/18 – 6/60 in the better eye) while uncorrected refractive errors were responsible for 32.9% (Table 26). In Deorai and Malda districts, refractive errors were more important causes of low vision than cataract.

More than half of all one eye blind were due to Cataract (Table 27). Uncorrected aphakia and cataract surgical complications together were responsible for more than 10% of one eye blindness across the country. Corneal scarring was another important cause of one eye blindness with 8% suffering due to corneal pathology other than trachoma.

3.5.5 Comparison of Presenting and Pinhole Vision

Even though best correction was not done as part of the survey, all individuals with a presenting vision < 6/18 in any eye were examined with a pinhole. It was observed that with a pinhole, more than half (54.7%) the individuals with low vision could improve to better than 6/18 (Table 28). However those with a presenting vision < 3/60 would not benefit much from correction as 88.6% of them did not improve with pinhole. Even among the economically blind, less than half improved with pinhole.

3.5.6 Comparison of Presenting and Pinhole Vision among Cataract Operated

Presenting and pinhole vision was also compared among the cataract operated. Even among those with an IOL implant, 60% could improve from < 6/18 to better than 6/18 with pinhole while 46% of those with a presenting vision of < 6/60-3/60 could be improved by pinhole. This signifies that many individuals need spectacles even after IOL surgery as standard power IOLs may be in vogue in many districts (Table 29). At the same time those who had an IOL implant and a presenting vision < 3/60 hardly improved as 87.2% continued to have a vision < 3/60 after pinhole.

Individuals who had a non-IOL cataract surgery did not seem to benefit much by correction as the proportion whose vision could improve with pinhole was much smaller than with IOL (Table 30). 65.9% of those with a presenting vision < 3/60 did not improve with pinhole.

3.5.7 Comparison of Blindness Prevalence With Previous Surveys

Observations from the Rapid Assessment of Blindness in 2006-2007 were compared with the observations from the same districts which were surveyed over the period 1998-2001 (Table 31). It was observed that overall there was a significant decrease in the prevalence of blindness when results were compared with earlier rapid assessments. Even in comparison to the earlier comprehensive detailed surveys,

there was a 0.5% reduction in the prevalence of blindness (vision < 6/60 in the better eye) among the 50+ population. Since 90% of blindness is seen among the 50+ population and this segment of the population is steadily increasing due to increased life expectancy, a decrease of 0.5% is significant. Only in two districts (Rajnandgaon and Parbhani) was the prevalence higher than in 2001. The increase in Rajnandgaon was marginal but the increase in Parbhani was significant.

3.5.8 Barriers to Cataract Surgery

The barriers to cataract surgery among the cataract blind (vision < 6/60 in the better eye with cataract as the cause of blindness in one or both eyes) were also studied. The barriers were categorized as awareness related, service related and other barriers.

Among the awareness related barriers, 22.3% did not get operated as they were unaware of their cataract (Table 32). Fear was stated by 6.8% while 8% stated that they were asked to wait for the cataract to mature before surgery. There were wide variations across the different districts in relation to the awareness related barriers.

Affordability was a barrier reported by 11.9% across the country (Table 33) while in another 15% either age or the fact that they did not feel the need for surgery were important barriers reported. The proportion who stated that they could not afford surgery was the highest in Malda district (28.5%).

Lack of escorts, adequate vision in the fellow eye and lack of time were other barriers reported (Table 34). Only 0.2% stated that they did not go for surgery as they were using other anti-cataract medications.

4. Extrapolating Blindness Prevalence to General Population

Most literature available in India and other parts of the world show that 90% of blindness is concentrated among the 50+ population as most blindness is age related. This assumption has been used to extrapolate the prevalence of blindness among the 50+ population to the population of all ages. As there has been a reduction in blindness in the 50+ population, it would lead to a decrease in the blindness load in the country.

Using the assumptions mentioned above, it is estimated that the prevalence of blindness in the total population would be 1.36% if presenting vision is considered and 1% if pinhole vision is considered (using a vision of < 6/60 in the better eye) (Table 35).

Using the WHO definition of vision < 3.60 in the better eye, the prevalence of blindness in the general population would be 0.61% with presenting vision and 0.51% with pinhole vision (Table 36).

5. Conclusions and Recommendations

The National Program for Control of Blindness has consistently based its projections and program implementation on evidence collected by reputed eye care institutions through population based surveys over the past three decades. For the first time in the country, a Rapid Assessment of Avoidable Blindness was undertaken. This methodology improves upon the methodology used in Rapid Assessment and allows causes of blindness to be established. This is achieved by coupling an eye examination by an ophthalmologist to the methodology used in rapid assessments. Therefore data can be comparable to both the rapid assessment as well as the detailed surveys conducted earlier.

It was observed that overall, the prevalence of low vision, economic blindness and social blindness had decreased in the districts covered compared to the earlier surveys. Lowest prevalence of all blindness (social + economic) was seen in Solan (Himachal Pradesh), Bhatinda (Punjab) and Palakkad (Kerala). Pooling data of all districts together the prevalence of blindness as defined by the National Program for Control of Blindness has shown a reduction of 6% in overall prevalence of blindness above the age of 50 years. This reduction is significant as there is an increasing life expectancy in India which translates into more and more people living beyond 50 years of age. Since a significant proportion of blindness in India is age related, any reduction above the age of 50 years is a direct gain from the strategies adopted by the National Program in the country.

The prevalence of blindness was observed to be 1.34 times higher in females compared to males. It is difficult to state whether this is due to a true rate of higher incidence among females or because of lack of access to services. Though a larger number of surgeries were reported by women this would be expected as 55% of the respondents were female.

The prevalence of blindness increased with age, with those above 70 years having a 16 times higher risk of being blind compared to those aged 50-54 years.

Cataract surgical coverage showed a significant increase compared to the previous surveys with 82.3% having at least one eye operated among those who had a vision $< 3/60$ and were blind from cataract. This is much higher than the previous surveys. In RAAB, analysis was also presented for cataract surgical coverage using the NPCB definition of blindness. For the first time this is being used in the country as it was felt that this would act as a baseline for future surveys as more and more people would get operated before they reach a stage of vision $< 3/60$.

The survey showed that the gains in Southern States (Andhra Pradesh, Kerala and Tamilnadu) and in high performing States like Gujarat continued to improve over the years. The biggest turnaround can be seen in the districts of Prakasam in Andhra Pradesh and Gulbarga in Karnataka compared to the earlier surveys. In fact three districts (Cuddalore, Prakasam and Surendranagar) were together responsible for a third of all surgeries reported in the country. Public-private partnership seems to be the key to the future as all three districts had a strong presence of NGO/private institutions in addition to the Government facilities.

Performance in the States of Orissa (Ganjam district) and West Bengal (Malda district) needs to be augmented so that the gains of the technological revolution in eye care can be effectively harnessed across the country.

There is a distinct increase in IOL surgeries in the past five years when results are compared to the earlier surveys. This is a welcome sign as more and more ophthalmologists are now adept at IOL implants than previously. Most of the survey districts have achieved more than 80% IOL rate in the past five years. However, though the total number of surgeries was higher among women, the IOL rate was 5% higher among men. This gender disparity needs to be addressed through innovative approaches.

A large proportion of individuals were not using spectacles after surgery and there were many who in spite of an IOL implant needed correction as they showed significant improvement with a pinhole.

Cataract remains the single largest cause of blindness, low vision and one eye blindness in India if the data of the 16 districts are pooled together. The trend is observed across all districts also. Results indicate that the country should continue to prioritize cataract surgical services and their augmentation. The support to other blinding conditions should not be at the cost of cataract as any slackening may prove catastrophic in the long run.

Lack of awareness and affordability still continue to be barriers to the uptake of cataract surgery in many parts of the country and efforts need to be made to surmount these barriers so that no person needlessly remains blind because of lack of knowledge or the lack of access due to financial constraints.

Extrapolating the results to the population of all ages across the country, it is evident that there has been a perceptible reduction in the prevalence of blindness in the country in spite of increased life expectancy. The country seems headed in the right direction and attention to problem regions on a priority basis will provide a further impetus to blindness control efforts in India.

Table 1: Coverage of Survey Population (50+)

| S.No. | State | District | Persons aged 50+ | | % |
|-------|------------------|---------------|------------------|----------|------|
| | | | Enumerated | Examined | |
| 1 | Himachal Pradesh | Solan | 2544 | 2535 | 99.6 |
| 2 | Punjab | Bhatinda | 2559 | 2548 | 99.6 |
| 3 | Rajasthan | Nagaur | 2510 | 2492 | 99.3 |
| 4 | Uttar Pradesh | Deoria | 2793 | 2452 | 87.8 |
| 5 | Uttar Pradesh | Jhansi | 2755 | 2464 | 89.4 |
| 6 | Bihar | Vaishali | 2772 | 2646 | 95.5 |
| 7 | West Bengal | Malda | 2744 | 2474 | 90.2 |
| 8 | Orissa | Ganjam | 2679 | 2543 | 94.9 |
| 9 | Chhattisgarh | Rajnandgaon | 2556 | 2556 | 100 |
| 10 | Madhya Pradesh | Shahdol | 2792 | 2505 | 89.7 |
| 11 | Gujarat | Surendranagar | 2775 | 2674 | 96.4 |
| 12 | Maharastra | Parbhani | 2727 | 2456 | 90.1 |
| 13 | Andhra Pradesh | Prakasam | 2688 | 2578 | 95.9 |
| 14 | Karnataka | Gulbarga | 2721 | 2488 | 91.4 |
| 15 | Kerala | Palakkad | 2546 | 2475 | 97.2 |
| 16 | Tamil Nadu | Cuddalore | 2561 | 2561 | 100 |
| Total | | | 42722 | 40447 | 94.7 |

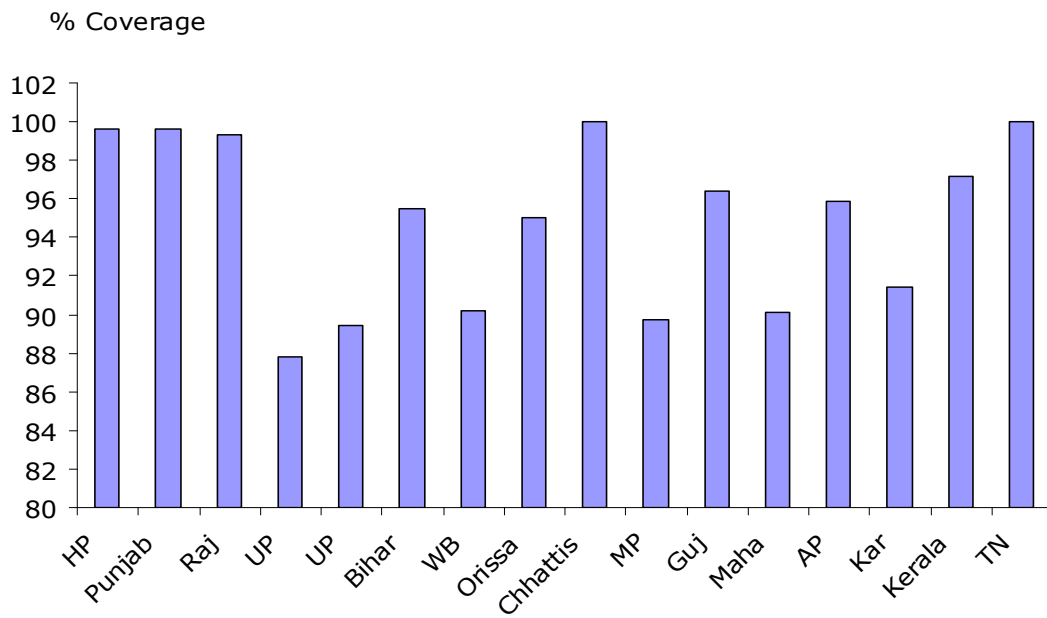


Table 2: Gender distribution of Subjects

| District | Enumerated | | | Examined | | |
|-------------|--------------|--------------|-------|---------------|--------------|-------|
| | Male (%) | Female (%) | Total | Male (%) | Female (%) | Total |
| Bhatinda | 1416 (55.3) | 1143 (44.7) | 2559 | 1412 (55.4) | 1136 (44.6) | 2548 |
| Cuddalore | 1109 (43.3) | 1452 (56.7) | 2561 | 1109 (43.3) | 1452 (56.7) | 2561 |
| Deoria | 1209 (43.3) | 1584 (56.7) | 2793 | 1020 (41.6) | 1432 (58.4) | 2452 |
| Ganjam | 1071 (40.0) | 1608 (60.0) | 2679 | 1023 (40.2) | 1520 (59.8) | 2543 |
| Gulbarga | 1053 (38.7) | 1668 (61.3) | 2721 | 944 (37.9) | 1544 (62.1) | 2488 |
| Jhansi | 1306 (47.4) | 1449 (52.6) | 2755 | 1123 (45.6) | 1341 (54.4) | 2464 |
| Malda | 1260 (45.9) | 1484 (54.1) | 2744 | 1083 (43.8) | 1391 (56.2) | 2474 |
| Nagaur | 1115 (44.4) | 1395 (55.6) | 2510 | 1105 (44.3) | 1387 (55.7) | 2492 |
| Palakkad | 1045 (41.0) | 1501 (59.0) | 2546 | 1004 (40.6) | 1471 (59.4) | 2475 |
| Parbhani | 1089 (39.9) | 1638 (60.1) | 2727 | 928 (37.8) | 1528 (62.2) | 2456 |
| Prakasam | 1167 (43.4) | 1521 (56.6) | 2688 | 1105 (42.9) | 1473 (57.1) | 2578 |
| Rajnandgaon | 1150 (45.0) | 1406 (55.0) | 2556 | 1150 (45.0) | 1406 (55.0) | 2556 |
| Shahdol | 1388 (49.7) | 1404 (50.3) | 2792 | 1239 (49.5) | 1266 (50.5) | 2505 |
| Solan | 1412 (55.5) | 1132 (44.5) | 2544 | 1405 (55.4) | 1130 (44.6) | 2535 |
| Surendrangr | 1257 (45.3) | 1518 (54.7) | 2775 | 1190 (44.5) | 1484 (55.5) | 2674 |
| Vaishali | 1413 (51.0) | 1359 (49.0) | 2772 | 1341 (50.7) | 1305 (49.3) | 2646 |
| Total (%) | 19460 (45.6) | 23262 (54.5) | 42722 | 18,181 (45.0) | 22266 (55.1) | 40447 |

Gender distribution of examined

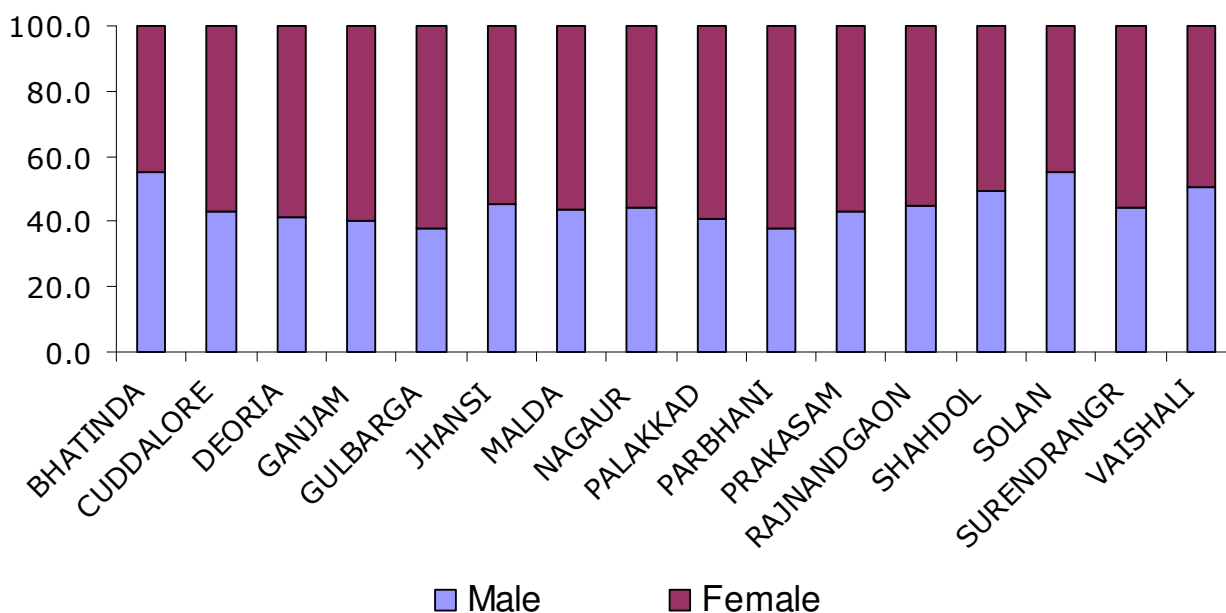


Table 3: Age distribution of enumerated population

| District | 50-54 (%) | 55-59 (%) | 60-64 (%) | 65-69 (%) | 70+ (%) | Total | Mean Age |
|-------------|-------------|-------------|-------------|-------------|-------------|-------|----------|
| Bhatinda | 578 (22.6) | 546 (21.3) | 485 (19.0) | 382 (14.9) | 568 (22.2) | 2559 | 61.9 |
| Cuddalore | 559 (21.8) | 565 (22.1) | 533 (20.8) | 365 (14.3) | 539 (21.1) | 2561 | 61.3 |
| Deoria | 562 (20.1) | 570 (20.4) | 571 (20.4) | 415 (14.9) | 675 (24.2) | 2793 | 62.0 |
| Ganjam | 294 (11.0) | 477 (17.8) | 714 (26.7) | 390 (14.6) | 804 (30.0) | 2679 | 63.5 |
| Gulbarga | 585 (21.5) | 604 (22.2) | 645 (23.7) | 356 (13.1) | 531 (19.5) | 2721 | 61.4 |
| Jhansi | 657 (23.9) | 581 (21.1) | 573 (20.8) | 427 (15.5) | 517 (18.8) | 2755 | 61.9 |
| Malda | 784 (28.6) | 663 (24.2) | 521 (19.0) | 315 (11.5) | 461 (16.8) | 2744 | 60.5 |
| Nagaur | 669 (26.7) | 415 (16.5) | 407 (16.2) | 393 (15.7) | 626 (24.9) | 2510 | 62.8 |
| Palakkad | 591 (23.2) | 482 (18.9) | 527 (20.7) | 346 (13.6) | 600 (23.6) | 2546 | 62.1 |
| Parbhani | 392 (14.4) | 587 (21.5) | 670 (24.6) | 557 (20.4) | 521 (19.1) | 2727 | 61.9 |
| Prakasam | 611 (22.7) | 538 (20.0) | 524 (19.5) | 356 (13.2) | 659 (24.5) | 2688 | 61.7 |
| Rajnandgaon | 555 (21.7) | 654 (25.6) | 554 (21.7) | 462 (18.1) | 331 (13.0) | 2556 | 61.0 |
| Shahdol | 686 (24.6) | 703 (25.2) | 666 (23.9) | 349 (12.5) | 388 (13.9) | 2792 | 59.7 |
| Solan | 777 (30.5) | 664 (26.1) | 372 (14.6) | 233 (9.2) | 498 (19.6) | 2544 | 60.3 |
| Surendrangr | 702 (25.3) | 664 (23.9) | 547 (19.7) | 388 (14.0) | 474 (17.1) | 2775 | 60.4 |
| Vaishali | 723 (26.1) | 449 (16.2) | 500 (18.0) | 351 (12.7) | 749 (27.0) | 2772 | 62.0 |
| Total (%) | 9725 (22.8) | 9162 (21.5) | 8809 (20.6) | 6085 (14.2) | 8941 (20.9) | 42722 | 61.5 |

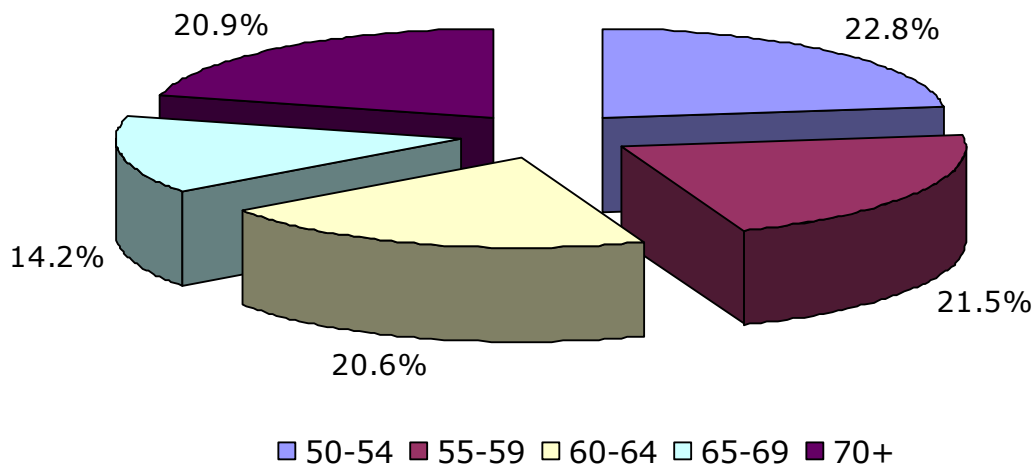


Table 4: Age distribution of examined

| District | 50-54 (%) | 55-59 (%) | 60-64 (%) | 65-69 (%) | 70+ (%) | Total | Mean Age |
|-------------|-------------|-------------|-------------|-------------|-------------|-------|----------|
| Bhatinda | 576 (23.0) | 544 (21.0) | 483 (19.0) | 380 (14.9) | 565 (22.2) | 2548 | 61.9 |
| Cuddalore | 559 (21.8) | 565 (22.1) | 533 (20.8) | 365 (14.3) | 539 (21.1) | 2561 | 61.3 |
| Deoria | 511 (21.0) | 485 (20.0) | 496 (20.0) | 368 (15.0) | 592 (24.1) | 2452 | 61.9 |
| Ganjam | 290 (11.4) | 457 (18.0) | 674 (26.5) | 373 (14.7) | 749 (29.5) | 2543 | 63.4 |
| Gulbarga | 550 (22.0) | 542 (22.0) | 588 (24.0) | 329 (13.2) | 479 (19.3) | 2488 | 61.3 |
| Jhansi | 606 (24.6) | 502 (20.4) | 503 (20.4) | 382 (15.5) | 471 (19.1) | 2464 | 62.0 |
| Malda | 763 (31.0) | 602 (24.0) | 436 (18.0) | 267 (10.8) | 406 (16.4) | 2474 | 60.2 |
| Nagaur | 665 (26.7) | 412 (16.5) | 401 (16.1) | 391 (15.7) | 623 (25.0) | 2492 | 62.8 |
| Palakkad | 578 (23.0) | 473 (19.0) | 506 (20.0) | 334 (13.5) | 584 (23.6) | 2475 | 62.1 |
| Parbhani | 362 (14.7) | 539 (22.0) | 587 (23.9) | 494 (20.1) | 474 (19.3) | 2456 | 61.9 |
| Prakasam | 589 (23.0) | 513 (20.0) | 506 (20.0) | 340 (13.2) | 630 (24.4) | 2578 | 61.7 |
| Rajnandgaon | 555 (21.7) | 654 (25.6) | 554 (21.7) | 462 (18.1) | 331 (13.0) | 2556 | 61.0 |
| Shahdol | 621 (24.8) | 630 (25.2) | 577 (23.0) | 319 (12.7) | 358 (14.3) | 2505 | 59.7 |
| Solan | 776 (30.6) | 661 (26.1) | 368 (14.5) | 233 (9.2) | 497 (19.6) | 2535 | 60.3 |
| Surendrangr | 688 (25.7) | 641 (24.0) | 519 (19.4) | 366 (13.7) | 460 (17.2) | 2674 | 60.4 |
| Vaishali | 699 (26.4) | 419 (15.8) | 474 (17.9) | 335 (12.7) | 719 (27.2) | 2646 | 62.0 |
| Total (%) | 9388 (23.2) | 8639 (21.4) | 8205 (20.3) | 5738 (14.2) | 8477 (21.0) | 40447 | 61.5 |

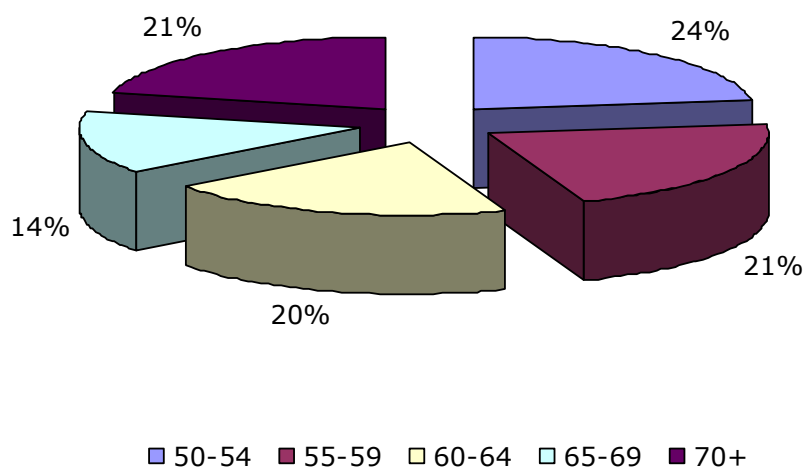


Table 5: Occupation status of Enumerated

| District | Work & earns income (%) | Work & no income (%) | House work (%) | No work (%) | No response (%) | Total |
|-------------|-------------------------|----------------------|----------------|-------------|-----------------|-------|
| Bhatinda | 1145 (44.7) | 172 (6.7) | 854 (33.4) | 354 (13.8) | 34 (1.3) | 2559 |
| Cuddalore | 638 (24.9) | 309 (12.1) | 1009 (39.4) | 605 (23.6) | 0 | 2561 |
| Deoria | 710 (25.4) | 147 (5.3) | 1445 (51.7) | 471 (16.9) | 20 (0.7) | 2793 |
| Ganjam | 518 (19.3) | 799 (29.8) | 622 (23.2) | 721 (26.9) | 19 (0.7) | 2679 |
| Gulbarga | 1230 (45.2) | 45 (1.7) | 888 (32.6) | 556 (20.4) | 2 (0.1) | 2721 |
| Jhansi | 906 (32.9) | 61 (2.2) | 1028 (37.3) | 733 (26.6) | 27 (1.0) | 2755 |
| Malda | 775 (28.2) | 104 (3.8) | 1467 (53.5) | 393 (14.3) | 5 (0.2) | 2744 |
| Nagaur | 373 (14.9) | 354 (14.1) | 1123 (44.7) | 660 (26.3) | 0 | 2510 |
| Palakkad | 659 (25.9) | 175 (6.9) | 1388 (54.5) | 321 (12.6) | 3 (0.1) | 2546 |
| Parbhani | 1037 (38.0) | 26 (1.0) | 909 (33.0) | 657 (24.1) | 98 (3.6) | 2727 |
| Prakasam | 1504 (56.0) | 75 (2.8) | 644 (24.0) | 463 (17.2) | 2 (0.1) | 2688 |
| Rajnandgaon | 1579 (61.8) | 295 (11.5) | 354 (13.9) | 328 (12.8) | 0 (0) | 2556 |
| Shahdol | 705 (25.3) | 1139 (40.8) | 699 (25.0) | 244 (8.7) | 5 (0.2) | 2792 |
| Solan | 1152 (45.3) | 10 (4.2) | 924 (36.3) | 363 (14.3) | 3 (0.1) | 2544 |
| Surendrangr | 946 (34.1) | 253 (9.1) | 1291 (46.5) | 281 (10.1) | 4 (0.1) | 2775 |
| Vaishali | 1145(41.3) | 33 (1.2) | 1042 (37.6) | 552 (19.9) | 0 | 2772 |
| Total (%) | 15022 (35.2) | 4089 (9.6) | 15687 (36.7) | 7702 (18.0) | 222 (0.5) | 42722 |

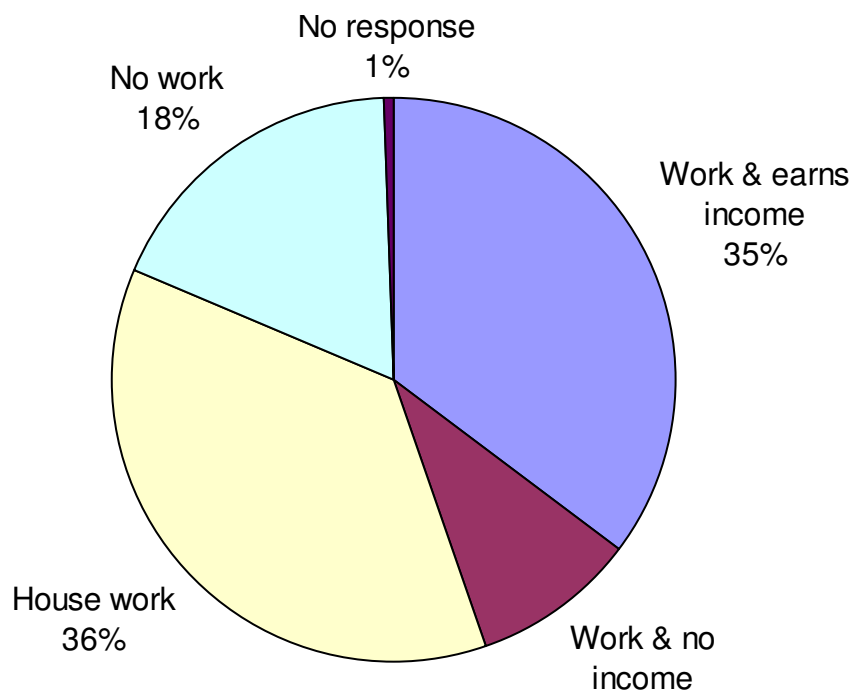


Table 6: Blindness Categories based on Presenting Vision

| District | Normal Vision (NN) (%) | Low Vision (LV) (%) | Economic Blindness (EB) (%) | Social Blindness (SB) (%) | One Eye Blind (UB) (%) | Total Examined |
|-------------|------------------------|---------------------|-----------------------------|---------------------------|------------------------|----------------|
| Bhatinda | 2047 (80.4) | 199 (7.8) | 51 (2.0) | 61 (2.4) | 188 (7.4) | 2546 |
| Cuddalore | 1600 (62.5) | 546 (21.3) | 115 (4.5) | 72 (2.8) | 228 (8.9) | 2561 |
| Deoria | 1325 (54.0) | 677 (27.6) | 225 (9.2) | 78 (3.2) | 147 (6.0) | 2452 |
| Ganjam | 1774 (69.8) | 399 (15.7) | 55 (2.2) | 199 (7.8) | 114 (4.5) | 2541 |
| Gulbarga | 1667 (67.0) | 393 (15.8) | 90(3.6) | 107 (4.3) | 231 (9.3) | 2488 |
| Jhansi | 1586 (64.4) | 391(15.9) | 116 (4.7) | 146 (5.9) | 224 (9.1) | 2463 |
| Malda | 1849 (74.8) | 363 (14.7) | 104 (4.2) | 63 (2.6) | 94 (3.8) | 2473 |
| Nagaur | 1701 (68.3) | 325 (13.0) | 83 (3.3) | 135 (5.4) | 248 (10.0) | 2492 |
| Palakkad | 2101 (84.9) | 166 (6.7) | 66 (2.7) | 25 (1.0) | 117 (4.7) | 2475 |
| Parbhani | 1576 (64.2) | 395 (16.1) | 166 (6.8) | 111 (4.5) | 208 (8.5) | 2456 |
| Prakasam | 1576 (61.1) | 569 (22.1) | 131 (5.1) | 88 (3.4) | 214 (8.3) | 2578 |
| Rajnandgaon | 1357 (53.1) | 786 (30.8) | 225 (8.8) | 112 (4.4) | 76 (3.0) | 2556 |
| Shahdol | 1870 (74.7) | 411 (16.4) | 84 (3.4) | 50 (2.0) | 90 (3.6) | 2505 |
| Solan | 2030 (80.1) | 319 (12.6) | 46 (1.8) | 35 (1.4) | 103 (4.1) | 2533 |
| Surendrangr | 2055 (76.9) | 314 (11.7) | 111 (4.2) | 42 (1.6) | 152 (5.7) | 2674 |
| Vaishali | 1717 (64.9) | 533 (20.1) | 129 (4.9) | 119 (4.5) | 148 (5.6) | 2646 |
| Total (%) | 27831 (68.8) | 6786 (16.8) | 1797 (4.4) | 1443 (3.6) | 2582 (6.4) | 40439 |

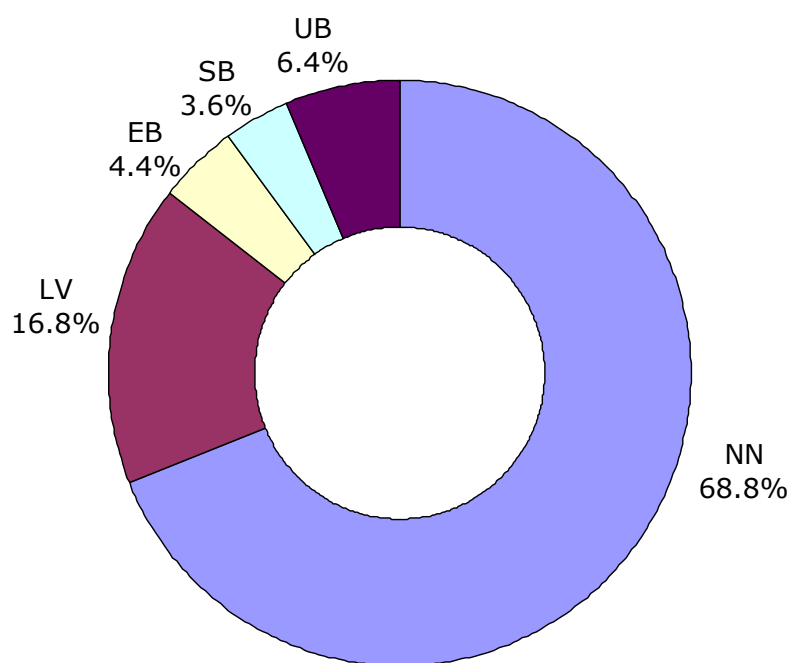


Table 7: Blindness Categories based on Pinhole Vision

| District | Normal (%) | Low Vision (%) | Economic Blindness (%) | Social Blindness (%) | One Eye Blind (%) | Total Examined |
|-------------|--------------|----------------|------------------------|----------------------|-------------------|----------------|
| Bhatinda | 2083 (81.8) | 163 (6.4) | 49 (1.9) | 60 (2.4) | 191 (7.5) | 2546 |
| Cuddalore | 1917 (74.9) | 347 (13.6) | 43 (1.7) | 50 (2.0) | 204 (8.0) | 2561 |
| Deoria | 1773 (72.3) | 317 (12.9) | 122 (5.0) | 61 (2.5) | 179 (7.3) | 2452 |
| Ganjam | 1929 (75.9) | 237 (9.3) | 63 (2.5) | 167 (6.6) | 145 (5.7) | 2541 |
| Gulbarga | 1900 (76.4) | 180 (7.2) | 67 (2.7) | 80 (3.2) | 261 (10.5) | 2488 |
| Jhansi | 1771 (71.9) | 249 (10.1) | 82 (3.3) | 129 (5.2) | 232 (9.4) | 2463 |
| Malda | 2107 (82.2) | 150 (5.8) | 62 (2.4) | 46 (1.8) | 108 (4.2) | 2473 |
| Nagaur | 1902 (76.3) | 178 (7.1) | 56 (2.3) | 110 (4.4) | 246 (9.9) | 2492 |
| Palakkad | 2164 (87.4) | 129 (5.2) | 44 (1.8) | 23 (0.9) | 115 (4.7) | 2475 |
| Parbhani | 1811 (73.7) | 211 (8.6) | 119 (4.9) | 96 (3.9) | 219 (8.9) | 2456 |
| Prakasam | 1877 (72.8) | 352 (13.7) | 81 (3.1) | 76 (2.9) | 192 (7.5) | 2578 |
| Rajnandgaon | 1808 (70.7) | 404 (15.8) | 133 (5.2) | 86 (3.4) | 125 (4.9) | 2556 |
| Shahdol | 2117 (84.5) | 174 (7.0) | 48 (1.9) | 42 (1.7) | 124 (5.0) | 2505 |
| Solan | 2173 (85.8) | 179 (7.1) | 41 (1.6) | 34(1.4) | 106 (4.2) | 2533 |
| Surendrangr | 2237 (83.7) | 189 (7.1) | 67 (2.5) | 39 (1.5) | 142 (5.3) | 2674 |
| Vaishali | 1918 (72.5) | 362 (13.7) | 89 (3.4) | 108 (4.1) | 169 (6.4) | 2646 |
| Total (%) | 31487 (77.9) | 3821 (9.5) | 1166 (2.9) | 1207 (3.0) | 2758 (6.8) | 40439 |

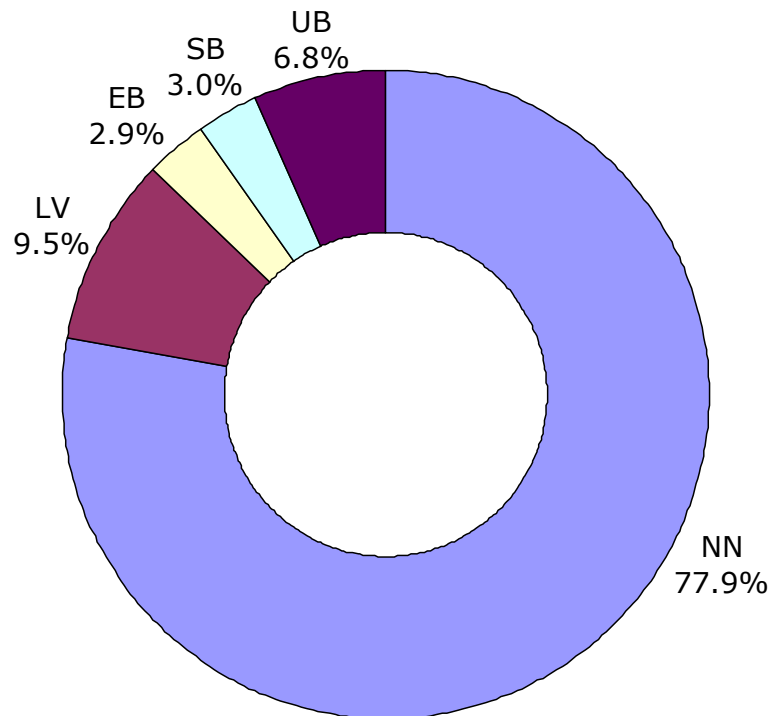


Table 8: Bilateral Blind persons (NPCB <6/60)

| District | Presenting (%) | Pinhole (%) | Total |
|-------------|----------------|-------------|-------|
| Bhatinda | 112 (4.4) | 109 (4.3) | 2548 |
| Cuddalore | 187 (7.3) | 93 (3.6) | 2561 |
| Deoria | 303 (12.4) | 183 (7.5) | 2452 |
| Ganjam | 254 (10.0) | 230 (9.0) | 2543 |
| Gulbarga | 197 (7.9) | 147 (5.9) | 2488 |
| Jhansi | 262 (10.6) | 211 (8.6) | 2464 |
| Malda | 167 (6.8) | 108 (4.4) | 2474 |
| Nagaur | 218 (8.8) | 166 (6.7) | 2492 |
| Palakkad | 91 (3.7) | 67 (2.7) | 2475 |
| Parbhani | 277 (11.3) | 215 (8.8) | 2456 |
| Prakasam | 219 (8.5) | 157 (6.1) | 2578 |
| Rajnandgaon | 337 (13.2) | 219 (8.6) | 2556 |
| Shahdol | 134 (5.4) | 90 (3.6) | 2505 |
| Solan | 81 (3.2) | 75 (3.0) | 2535 |
| Surendrangr | 153 (5.7) | 106 (4.0) | 2674 |
| Vaishali | 248 (9.4) | 197 (7.5) | 2646 |
| Total (%) | 3240 (8.0) | 2373 (5.9) | 40447 |

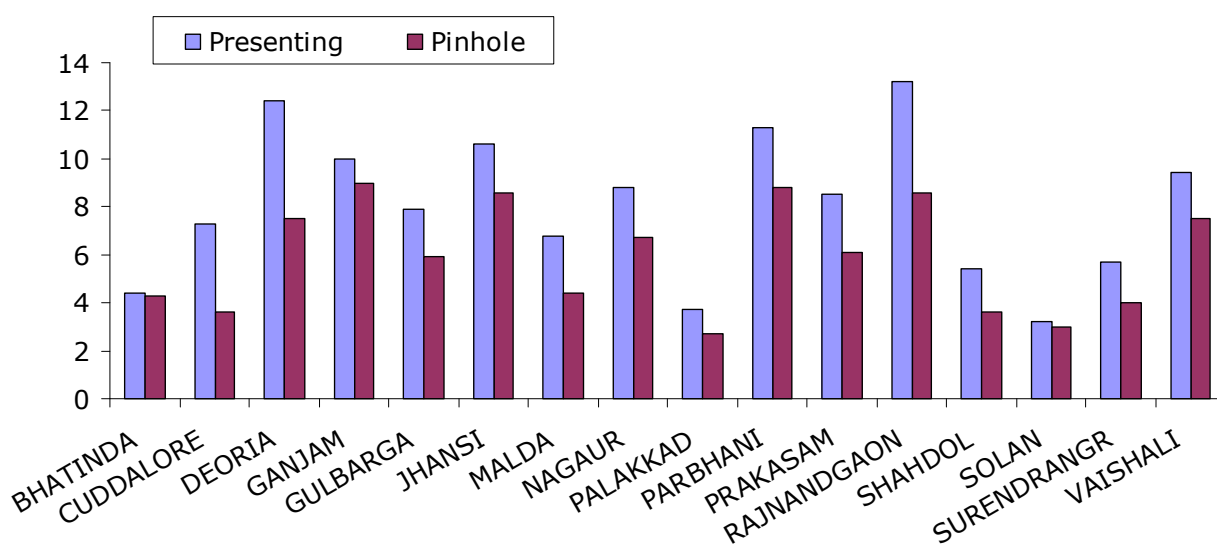


Table 9: Gender wise NPCB blind (<6/60) - Presenting Vision

| District | Male (%) | Total | Female (%) | Total |
|-------------|------------|-------|------------|-------|
| Bhatinda | 52 (3.7) | 1412 | 60 (5.3) | 1136 |
| Cuddalore | 64 (5.8) | 1109 | 123 (8.5) | 1452 |
| Deoria | 104 (10.2) | 1020 | 199 (13.9) | 1432 |
| Ganjam | 87 (8.5) | 1023 | 167 (11.0) | 1520 |
| Gulbarga | 73 (7.7) | 944 | 124 (8.0) | 1544 |
| Jhansi | 92 (8.2) | 1123 | 170 (12.7) | 1341 |
| Malda | 65 (6.0) | 1083 | 102 (7.3) | 1391 |
| Nagaur | 87 (7.9) | 1105 | 131 (9.4) | 1387 |
| Palakkad | 24 (2.4) | 1004 | 67 (4.6) | 1471 |
| Parbhani | 90 (9.7) | 928 | 187 (12.2) | 1528 |
| Prakasam | 77 (7.0) | 1105 | 142 (9.6) | 1473 |
| Rajnandgaon | 122 (10.6) | 1150 | 215 (15.3) | 1406 |
| Shahdol | 56 (4.5) | 1239 | 78 (6.2) | 1266 |
| Solan | 40 (2.9) | 1405 | 41 (3.6) | 1130 |
| Surendrangr | 62 (5.2) | 1190 | 91 (6.1) | 1484 |
| Vaishali | 95 (7.1) | 1341 | 153 (11.7) | 1305 |
| Total (%) | 1190 (6.6) | 18181 | 2050 (9.2) | 22266 |

Table 10: Gender wise NPCB blind (<6/60)- Pinhole Vision

| DISTRICT | Male (%) | Total | Female (%) | Total |
|-------------|-----------|-------|------------|-------|
| Bhatinda | 51 (3.6) | 1412 | 58 (5.1) | 1136 |
| Cuddalore | 36 (3.3) | 1109 | 57 (3.9) | 1452 |
| Deoria | 61 (6.0) | 1020 | 122 (8.5) | 1432 |
| Ganjam | 78 (7.6) | 1023 | 152 (10.0) | 1520 |
| Gulbarga | 54 (5.7) | 944 | 93 (6.0) | 1544 |
| Jhansi | 72 (6.4) | 1123 | 139 (10.4) | 1341 |
| Malda | 44 (4.1) | 1083 | 64 (4.6) | 1391 |
| Nagaur | 63 (5.7) | 1105 | 103 (7.4) | 1387 |
| Palakkad | 17 (1.7) | 1004 | 50 (3.4) | 1471 |
| Parbhani | 70 (7.5) | 928 | 145 (9.5) | 1528 |
| Prakasam | 57 (5.2) | 1105 | 100 (6.8) | 1473 |
| Rajnandgaon | 83 (7.2) | 1150 | 136 (9.7) | 1406 |
| Shahdol | 39 (3.2) | 1239 | 51 (4.0) | 1266 |
| Solan | 40 (2.9) | 1405 | 35 (3.1) | 1130 |
| Surendrangr | 42 (3.5) | 1190 | 64 (4.3) | 1484 |
| Vaishali | 76 (5.7) | 1341 | 121 (9.3) | 1305 |
| Total (%) | 883 (4.9) | 18181 | 1490 (6.7) | 22266 |

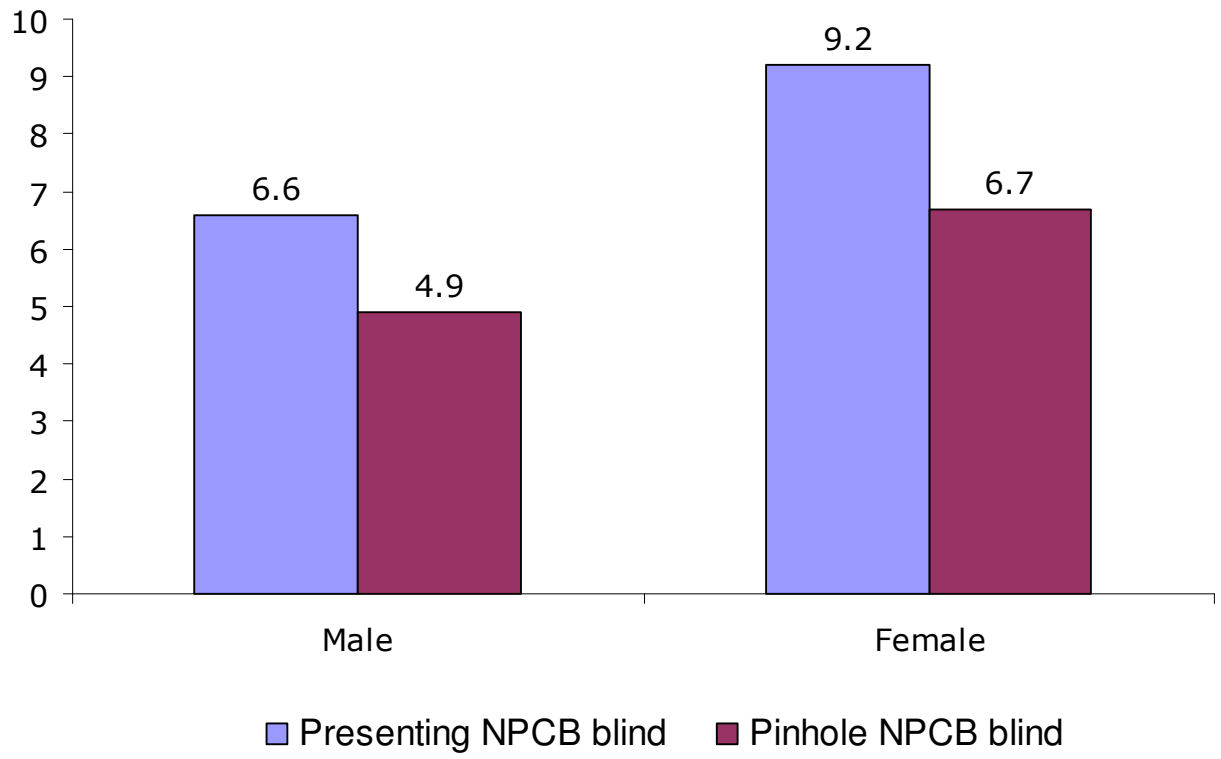


Table 11: Age specific prevalence of NPCB Blindness (Presenting)

| District | 50-54 years | | 55-59 years | | 60-64 years | | 65-69 years | | 70 years and above | |
|-------------|------------------|----------|------------------|----------|------------------|----------|------------------|----------|--------------------|----------|
| | No. of blind (%) | No. Exam | No. of blind (%) | No. Exam | No. of blind (%) | No. Exam | No. of blind (%) | No. Exam | No. of blind (%) | No. Exam |
| Bhatinda | 4 (0.7) | 576 | 7 (1.3) | 544 | 17 (3.5) | 483 | 12 (3.2) | 380 | 72 (12.7) | 565 |
| Cuddalore | 16 (2.9) | 559 | 22 (3.9) | 565 | 42 (7.9) | 533 | 36 (9.9) | 365 | 71 (13.2) | 539 |
| Deoria | 11 (2.2) | 511 | 22 (4.5) | 485 | 55 (11.1) | 496 | 51 (13.9) | 368 | 164 (27.7) | 592 |
| Ganjam | 2 (0.7) | 290 | 9 (2.0) | 457 | 52 (7.8) | 674 | 31 (8.3) | 373 | 160 (21.4) | 749 |
| Gulbarga | 7 (1.3) | 550 | 15 (2.8) | 542 | 41 (7.0) | 588 | 40 (12.2) | 329 | 94 (19.6) | 479 |
| Jhansi | 9 (1.5) | 606 | 23 (4.6) | 502 | 52 (10.3) | 503 | 54 (14.1) | 382 | 124 (26.3) | 471 |
| Malda | 9 (1.2) | 763 | 14 (2.3) | 602 | 21 (4.8) | 436 | 32 (12.0) | 267 | 91 (22.4) | 406 |
| Nagaur | 10 (1.5) | 665 | 11 (2.7) | 412 | 23 (5.7) | 401 | 41 (10.5) | 391 | 133 (21.4) | 623 |
| Palakkad | 1 (0.2) | 578 | 3 (0.6) | 473 | 8 (1.6) | 506 | 9 (2.7) | 334 | 70 (12.0) | 584 |
| Parbhani | 2 (0.6) | 362 | 19 (3.5) | 539 | 48 (8.2) | 587 | 70 (14.2) | 494 | 138 (29.1) | 474 |
| Prakasam | 11 (1.9) | 589 | 23 (4.5) | 513 | 29 (5.7) | 506 | 28 (8.2) | 340 | 128 (20.3) | 630 |
| Rajnandgaon | 12 (2.2) | 555 | 33 (5.1) | 654 | 73 (13.2) | 554 | 91 (19.7) | 462 | 128 (38.7) | 331 |
| Shahdol | 6 (0.97) | 621 | 7 (1.1) | 630 | 15 (2.6) | 577 | 25 (7.8) | 319 | 81 (22.6) | 358 |
| Solan | 1 (0.1) | 776 | 7 (1.1) | 661 | 10 (2.7) | 368 | 7 (3.0) | 233 | 56 (11.3) | 497 |
| Surendrangr | 9 (1.3) | 688 | 12 (1.9) | 641 | 20 (3.9) | 519 | 31 (8.5) | 366 | 81 (17.6) | 460 |
| Vaishali | 13 (1.9) | 699 | 13 (3.1) | 419 | 31 (6.5) | 474 | 39 (11.6) | 335 | 152 (21.1) | 719 |
| Total | 123 (1.3) | 9388 | 240 (2.8) | 8639 | 537 (6.5) | 8205 | 597 (10.4) | 5738 | 1743(20.6) | 8477 |

Table 12: Age specific prevalence of NPCB Blindness (Pinhole vision)

| District | 50-54 years | | 55-59 years | | 60-64 years | | 65-69 years | | 70 years and above | |
|-------------|------------------|----------|------------------|----------|------------------|----------|------------------|----------|--------------------|--------------|
| | No. of blind (%) | No. Exam | No. of blind (%) | No. Exam | No. of blind (%) | No. Exam | No. of blind (%) | No. Exam | No. of blind (%) | No. Examined |
| Bhatinda | 4 (0.7) | 576 | 7 (1.3) | 544 | 16 (3.3) | 483 | 12 (3.2) | 380 | 70 (12.4) | 565 |
| Cuddalore | 6 (1.1) | 559 | 4 (0.7) | 565 | 21 (3.9) | 533 | 16 (4.4) | 365 | 46 (8.5) | 539 |
| Deoria | 6 (1.2) | 511 | 7 (1.4) | 485 | 34 (6.9) | 496 | 27 (7.3) | 368 | 109 (18.4) | 592 |
| Ganjam | 2 (0.7) | 290 | 7 (1.5) | 457 | 46 (6.8) | 674 | 28 (7.5) | 373 | 147 (19.6) | 749 |
| Gulbarga | 5 (0.9) | 550 | 9 (1.7) | 542 | 30 (5.1) | 588 | 27 (8.2) | 329 | 76 (15.9) | 479 |
| Jhansi | 7 (1.2) | 606 | 18 (3.6) | 502 | 40 (8.0) | 503 | 47 (12.3) | 382 | 99 (21.0) | 471 |
| Malda | 7 (0.9) | 763 | 10 (1.7) | 602 | 13 (3.0) | 436 | 18 (6.7) | 267 | 60 (14.8) | 406 |
| Nagaur | 6 (0.9) | 665 | 8 (1.9) | 412 | 15 (3.7) | 401 | 27 (6.9) | 391 | 110 (17.7) | 623 |
| Palakkad | 1 (0.2) | 578 | 2 (0.4) | 473 | 5 (0.99) | 506 | 7 (2.1) | 334 | 52 (8.9) | 584 |
| Parbhani | 1 (0.3) | 362 | 11 (2.0) | 539 | 32 (5.5) | 587 | 52 (10.5) | 494 | 119 (25.1) | 474 |
| Prakasam | 7 (1.2) | 589 | 12 (2.3) | 513 | 16 (3.2) | 506 | 20 (5.9) | 340 | 102 (16.2) | 630 |
| Rajnandgaon | 5 (0.9) | 555 | 19 (2.9) | 654 | 44 (7.9) | 554 | 57 (12.3) | 462 | 94 (28.4) | 331 |
| Shahdol | 5 (0.8) | 621 | 6 (0.95) | 630 | 10 (1.7) | 577 | 15 (4.7) | 319 | 54 (15.1) | 358 |
| Solan | 1 (0.1) | 776 | 6 (0.9) | 661 | 10 (2.7) | 368 | 6 (2.6) | 233 | 52 (10.5) | 497 |
| Surendrangr | 6 (0.9) | 688 | 7 (1.1) | 641 | 16 (3.1) | 519 | 18 (4.9) | 366 | 59 (12.8) | 460 |
| Vaishali | 9 (1.3) | 699 | 9 (2.2) | 419 | 24 (5.1) | 474 | 30 (9.0) | 335 | 125 (17.4) | 719 |
| Total | 78 (0.8) | 9388 | 142 (1.6) | 8639 | 372 (4.5) | 8205 | 407 (7.1) | 5738 | 1374 (16.2) | 8477 |

Age specific prevalence of NPCB Blindness

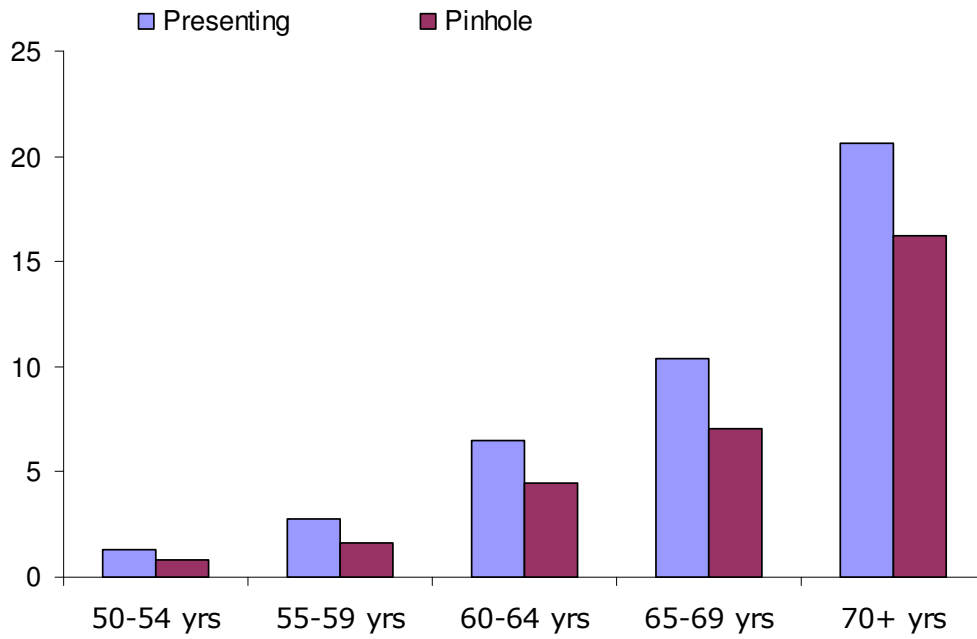


Table 13: Cataract surgical coverage (Persons)

| District | Cataract operated persons | Cat. Not operated with vision <6/60 | Total unop+op. (<6/60) | Surgical coverage <6/60 | Vision <3/60 with cataract | Total unop+op. (<3/60) | Surgical cov. <3/60 |
|-------------|---------------------------|-------------------------------------|------------------------|-------------------------|----------------------------|------------------------|---------------------|
| Bhatinda | 309 | 77 | 386 | 80.1 | 31 | 340 | 90.9 |
| Cuddalore | 621 | 149 | 770 | 80.6 | 51 | 672 | 92.4 |
| Deoria | 224 | 270 | 494 | 45.3 | 69 | 293 | 76.5 |
| Ganjam | 217 | 215 | 432 | 50.2 | 170 | 387 | 56.1 |
| Gulbarga | 229 | 172 | 401 | 57.1 | 91 | 320 | 71.6 |
| Jhansi | 356 | 187 | 543 | 65.6 | 98 | 454 | 78.4 |
| Malda | 151 | 157 | 308 | 49.0 | 59 | 210 | 71.9 |
| Nagaur | 433 | 165 | 598 | 72.4 | 96 | 529 | 81.9 |
| Palakkad | 297 | 76 | 373 | 79.6 | 19 | 316 | 94.0 |
| Parbhani | 338 | 240 | 578 | 58.5 | 91 | 429 | 78.8 |
| Prakasam | 476 | 195 | 671 | 70.9 | 72 | 548 | 86.9 |
| Rajnandgaon | 349 | 284 | 633 | 55.1 | 85 | 434 | 80.4 |
| Shahdol | 195 | 106 | 301 | 64.8 | 38 | 233 | 83.7 |
| Solan | 275 | 56 | 331 | 83.1 | 20 | 295 | 93.2 |
| Surendrangr | 511 | 96 | 607 | 84.2 | 18 | 529 | 96.6 |
| Vaishali | 193 | 223 | 416 | 46.4 | 107 | 300 | 64.3 |
| Total | 5174 | 2668 | 7842 | 66.0 | 1115 | 6289 | 82.3 |

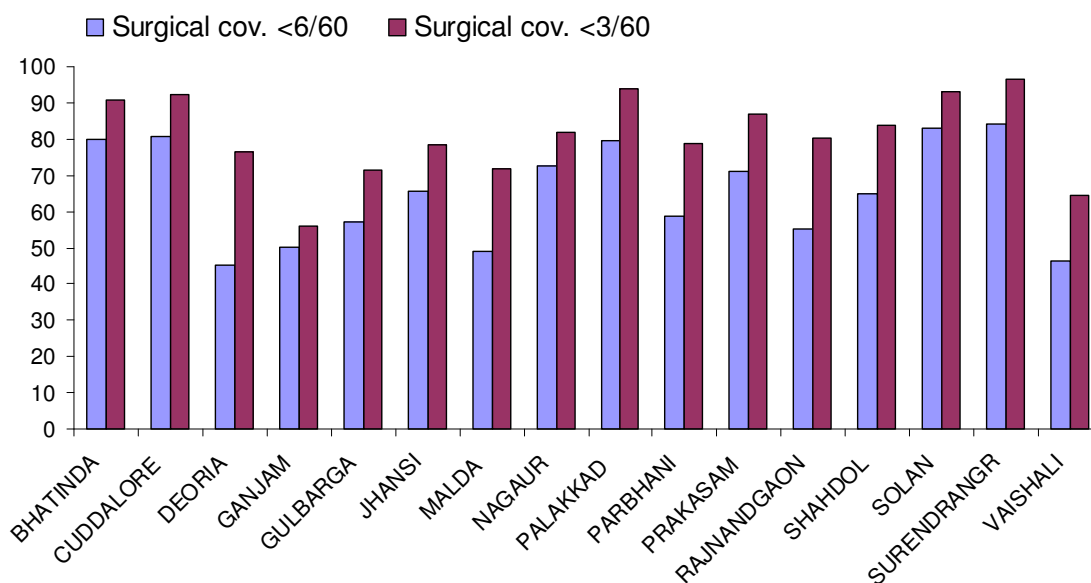


Table 14: Cataract surgical coverage (Eyes)

| District | Eyes operated for cataract | Unop. Eyes with vision <6/60 | Total | Surgical Coverage % | Unop. Eyes with vision <3/60 | Total | Surgical Coverage % |
|-------------|----------------------------|------------------------------|-------|---------------------|------------------------------|-------|---------------------|
| Bhatinda | 440 | 258 | 698 | 63.0 | 150 | 590 | 74.6 |
| Cuddalore | 909 | 532 | 1441 | 63.1 | 277 | 1186 | 76.6 |
| Deoria | 283 | 748 | 1031 | 27.4 | 315 | 598 | 47.3 |
| Ganjam | 302 | 547 | 849 | 35.6 | 457 | 759 | 39.8 |
| Gulbarga | 286 | 606 | 892 | 32.1 | 392 | 678 | 42.2 |
| Jhansi | 491 | 581 | 1072 | 45.8 | 367 | 858 | 57.2 |
| Malda | 199 | 436 | 635 | 31.3 | 214 | 413 | 48.2 |
| Nagaur | 588 | 535 | 1123 | 52.4 | 387 | 975 | 60.3 |
| Palakkad | 441 | 261 | 702 | 62.8 | 104 | 545 | 80.9 |
| Parbhani | 440 | 659 | 1099 | 40.0 | 320 | 760 | 57.9 |
| Prakasam | 677 | 640 | 1317 | 51.4 | 310 | 987 | 68.6 |
| Rajnandgaon | 499 | 692 | 1191 | 41.9 | 258 | 757 | 65.9 |
| Shahdol | 264 | 304 | 568 | 46.5 | 149 | 413 | 63.9 |
| Solan | 407 | 207 | 614 | 66.3 | 105 | 512 | 79.5 |
| Surendrangr | 786 | 273 | 1059 | 74.2 | 89 | 875 | 89.8 |
| Vaishali | 241 | 684 | 925 | 26.1 | 391 | 632 | 38.1 |
| Total | 7253 | 7963 | 15216 | 47.7 | 4285 | 11538 | 62.9 |

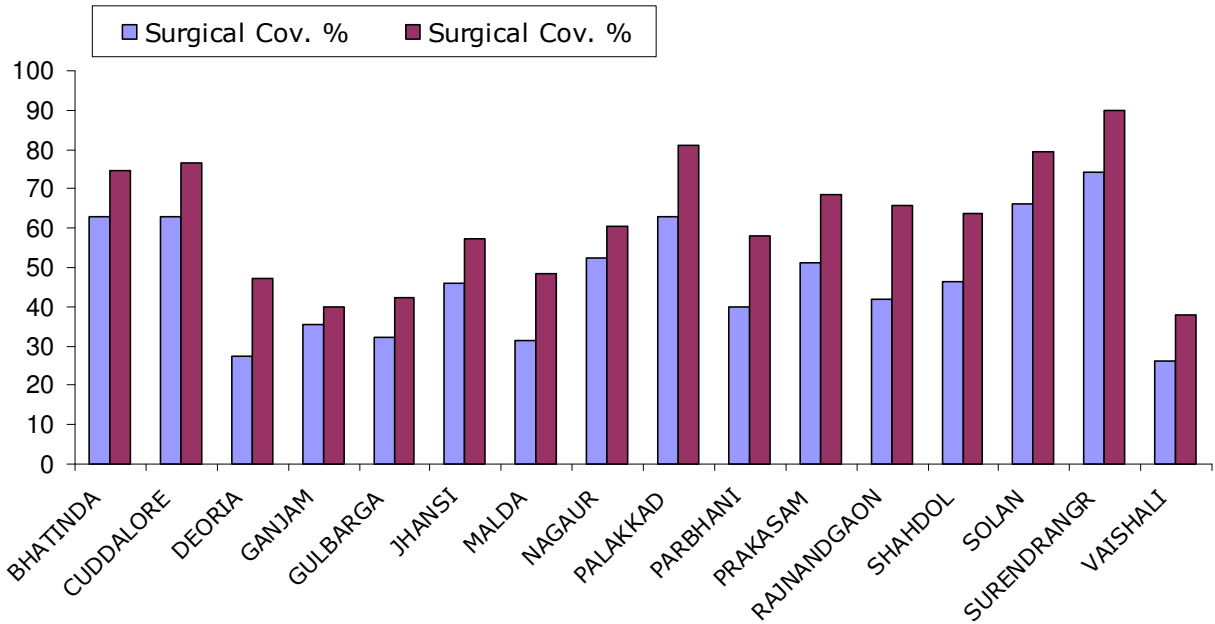


Table 15: Distribution of Cataract Operated in Districts

| District | Total Catops | Male | Female | 2002-2007 | 1997-2001 | < 1997 | Don't know |
|-------------|--------------|------|--------|-----------|-----------|--------|------------|
| Bhatinda | 408 | 203 | 205 | 209 | 108 | 60 | 31 |
| Cuddalore | 901 | 406 | 495 | 639 | 172 | 71 | 19 |
| Deoria | 280 | 120 | 160 | 175 | 82 | 15 | 8 |
| Ganjam | 302 | 128 | 174 | 193 | 81 | 22 | 6 |
| Gulbarga | 371 | 137 | 234 | 203 | 91 | 32 | 45 |
| Jhansi | 487 | 182 | 305 | 310 | 107 | 56 | 14 |
| Malda | 197 | 92 | 105 | 113 | 48 | 23 | 13 |
| Nagaur | 583 | 270 | 313 | 354 | 130 | 89 | 10 |
| Palakkad | 447 | 161 | 286 | 266 | 114 | 58 | 9 |
| Parbhani | 422 | 178 | 244 | 262 | 121 | 34 | 5 |
| Prakasam | 683 | 291 | 392 | 447 | 160 | 70 | 6 |
| Rajnandgaon | 508 | 211 | 297 | 359 | 113 | 27 | 9 |
| Shahdol | 268 | 123 | 145 | 185 | 54 | 27 | 2 |
| Solan | 413 | 200 | 213 | 242 | 103 | 56 | 12 |
| Surendrangr | 787 | 289 | 498 | 453 | 202 | 111 | 21 |
| Vaishali | 239 | 113 | 126 | 172 | 45 | 19 | 3 |
| Total | 7296 | 3104 | 4192 | 4582 | 1731 | 770 | 213 |

Table 16: District wise IOL rate

| District | Total cats done | No. of IOLs | % IOL |
|-------------|-----------------|-------------|-------|
| Bhatinda | 408 | 198 | 48.5 |
| Cuddalore | 901 | 685 | 76.0 |
| Deoria | 280 | 158 | 56.4 |
| Ganjam | 302 | 180 | 59.6 |
| Gulbarga | 371 | 220 | 59.3 |
| Jhansi | 487 | 176 | 36.1 |
| Malda | 197 | 94 | 47.7 |
| Nagaur | 583 | 364 | 62.4 |
| Palakkad | 447 | 373 | 83.4 |
| Parbhani | 422 | 265 | 62.8 |
| Prakasam | 683 | 471 | 69.0 |
| Rajnandgaon | 508 | 321 | 63.2 |
| Shahdol | 268 | 168 | 62.7 |
| Solan | 413 | 254 | 61.5 |
| Surendrangr | 787 | 557 | 70.8 |
| Vaishali | 239 | 157 | 65.7 |
| Total | 7296 | 4641 | 63.6 |

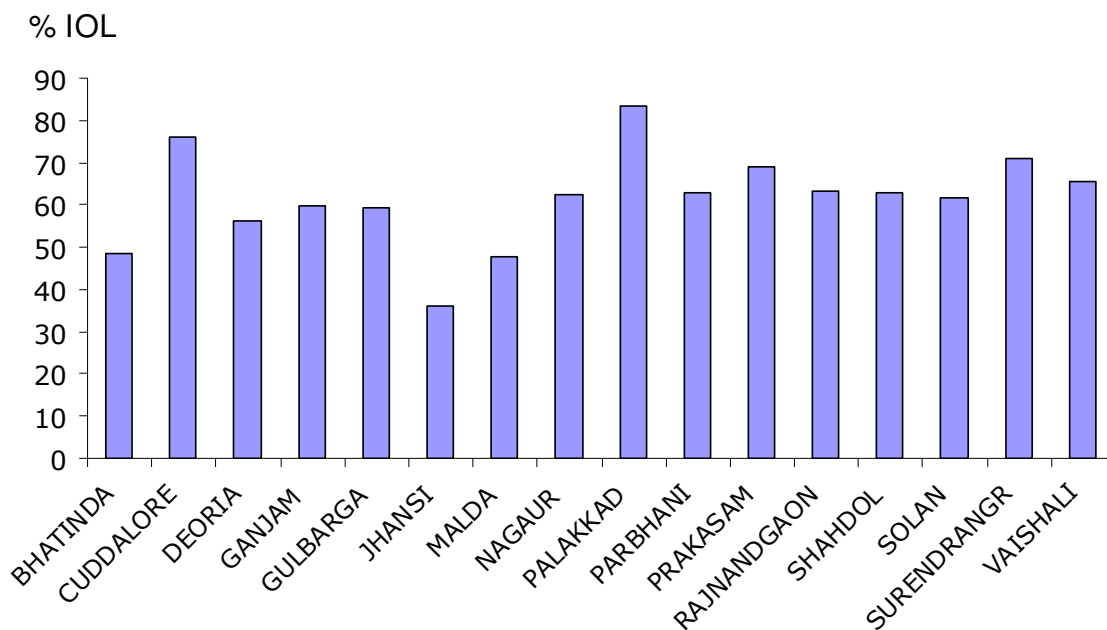


Table 17: Distribution of IOL rate in IOL Operated cases by year

| District | 2002-2007 | | | 1997-2001 | | | Before 1997 | | |
|-------------|-----------|---------------|--------------|-----------|---------------|--------------|-------------|---------------|--------------|
| | RE+LE IOL | Total surgery | IOL rate (%) | RE+LE IOL | Total surgery | IOL rate (%) | RE+LE IOL | Total surgery | IOL rate (%) |
| Bhatinda | 148 | 209 | 70.8 | 27 | 108 | 25.0 | 10 | 60 | 16.7 |
| Cuddalore | 574 | 639 | 89.8 | 101 | 172 | 58.7 | 9 | 71 | 12.7 |
| Deoria | 125 | 175 | 71.4 | 25 | 82 | 30.5 | 3 | 15 | 20.0 |
| Ganjam | 161 | 193 | 83.4 | 17 | 81 | 21.0 | 0 | 22 | 0.0 |
| Gulbarga | 150 | 203 | 73.9 | 30 | 91 | 33.0 | 6 | 32 | 18.8 |
| Jhansi | 153 | 310 | 49.4 | 18 | 107 | 16.8 | 0 | 56 | 0.0 |
| Malda | 74 | 113 | 65.5 | 10 | 48 | 20.8 | 0 | 23 | 0.0 |
| Nagaur | 289 | 354 | 81.6 | 54 | 130 | 41.5 | 13 | 89 | 14.6 |
| Palakkad | 258 | 266 | 97.0 | 94 | 114 | 82.5 | 19 | 58 | 32.8 |
| Parbhani | 217 | 262 | 82.8 | 44 | 121 | 36.4 | 2 | 34 | 5.9 |
| Prakasam | 393 | 447 | 87.9 | 72 | 160 | 45.0 | 6 | 70 | 8.6 |
| Rajnandgaon | 287 | 359 | 79.9 | 26 | 113 | 23.0 | 2 | 27 | 7.4 |
| Shahdol | 162 | 185 | 87.6 | 6 | 54 | 11.1 | 0 | 27 | 0.0 |
| Solan | 212 | 242 | 87.6 | 38 | 103 | 36.9 | 3 | 56 | 5.4 |
| Surendrangr | 421 | 453 | 92.9 | 123 | 202 | 60.9 | 11 | 111 | 9.9 |
| Vaishali | 141 | 172 | 82.0 | 11 | 45 | 24.4 | 4 | 19 | 21.1 |
| Total | 3765 | 4582 | 82.2 | 696 | 1731 | 40.2 | 88 | 770 | 11.4 |

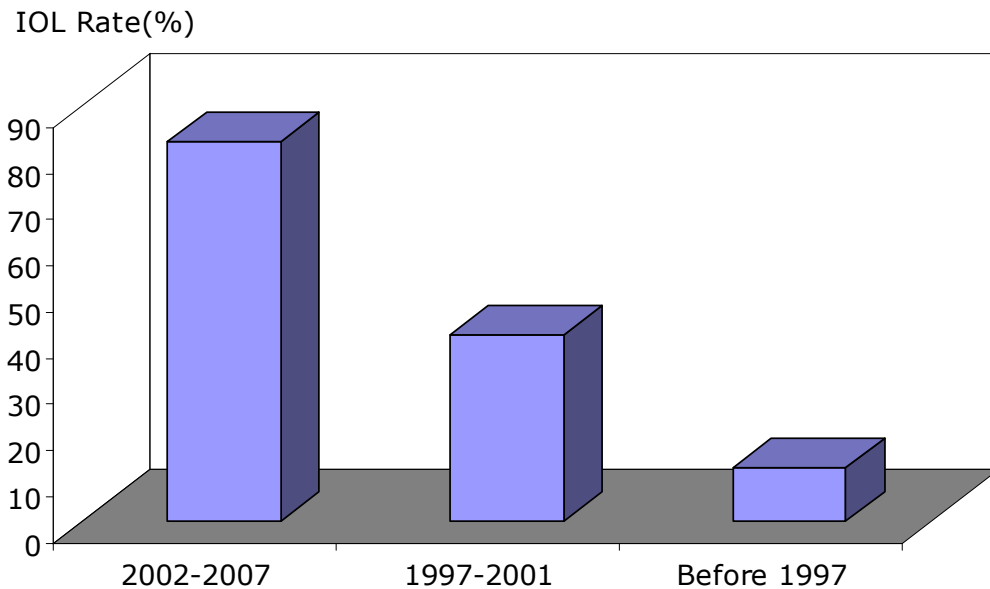


Table 18: Gender distribution of IOL rate in Operated cases

| District | Male | Total surgery | % IOL | Female | Total surgery | % IOL |
|-------------|------|---------------|-------|--------|---------------|-------|
| Bhatinda | 112 | 203 | 55.2 | 86 | 205 | 42.0 |
| Cuddalore | 306 | 406 | 75.4 | 379 | 495 | 76.6 |
| Deoria | 78 | 120 | 65.0 | 80 | 160 | 50.0 |
| Ganjam | 73 | 128 | 57.0 | 107 | 174 | 61.5 |
| Gulbarga | 79 | 137 | 57.7 | 141 | 234 | 60.3 |
| Jhansi | 73 | 182 | 40.1 | 103 | 305 | 33.8 |
| Malda | 46 | 92 | 50.0 | 48 | 105 | 45.7 |
| Nagaur | 176 | 270 | 65.2 | 188 | 313 | 60.1 |
| Palakkad | 151 | 161 | 93.8 | 222 | 286 | 77.6 |
| Parbhani | 114 | 178 | 64.0 | 151 | 244 | 61.9 |
| Prakasam | 208 | 291 | 71.5 | 263 | 392 | 67.1 |
| Rajnandgaon | 140 | 211 | 66.4 | 181 | 297 | 60.9 |
| Shahdol | 84 | 123 | 68.3 | 84 | 145 | 57.9 |
| Solan | 127 | 200 | 63.5 | 127 | 213 | 59.6 |
| Surendrangr | 216 | 289 | 74.7 | 341 | 498 | 68.5 |
| Vaishali | 74 | 113 | 65.5 | 83 | 126 | 65.9 |
| Total | 2057 | 3104 | 66.3 | 2584 | 4192 | 61.6 |

Gender distribution of IOL rate in Operated cases

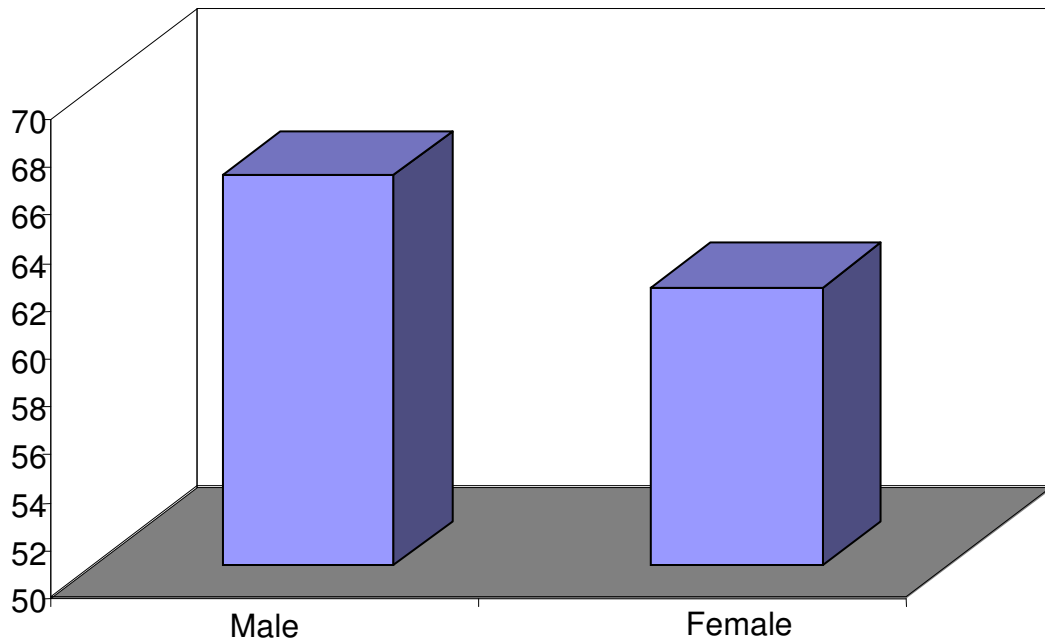


Table 19: Visual Acuity of Operated cases by type of surgery (Non-IOL)

| District | > 6/18 (%) | 6/18-6/60 (%) | 6/60-3/60 (%) | <3/60 (%) | Total |
|-------------|------------|---------------|---------------|------------|-------|
| Bhatinda | 118 (56.2) | 49 (23.3) | 11 (5.2) | 32 (15.2) | 210 |
| Cuddalore | 72 (33.3) | 35 (16.2) | 16 (7.4) | 93 (43.1) | 216 |
| Deoria | 29 (23.8) | 48 (39.3) | 25 (20.5) | 20 (16.4) | 122 |
| Ganjam | 9 (7.4) | 32 (26.2) | 9 (7.4) | 72 (59.0) | 122 |
| Gulbarga | 56 (37.1) | 25 (16.6) | 13 (8.6) | 57 (37.7) | 151 |
| Jhansi | 114 (36.7) | 64 (20.6) | 38 (12.2) | 95 (30.5) | 311 |
| Malda | 55 (53.4) | 14 (13.6) | 6 (5.8) | 28 (27.2) | 103 |
| Nagaur | 78 (35.6) | 50 (22.8) | 24 (11.0) | 67 (30.6) | 219 |
| Palakkad | 34 (45.9) | 12 (16.2) | 20 (27.0) | 8 (10.8) | 74 |
| Parbhani | 27 (17.2) | 55 (35.0) | 32 (20.4) | 43 (27.4) | 157 |
| Prakasam | 57 (26.9) | 51 (24.1) | 29 (13.7) | 75 (35.4) | 212 |
| Rajnandgaon | 31 (16.6) | 44 (23.5) | 40 (21.4) | 72 (38.5) | 187 |
| Shahdol | 10 (10.0) | 32 (32) | 18 (18.0) | 40 (40.0) | 100 |
| Solan | 55 (34.6) | 56 (35.2) | 15 (9.4) | 33 (20.8) | 159 |
| Surendrangr | 71 (30.9) | 58 (25.2) | 53 (23.0) | 48 (20.9) | 230 |
| Vaishali | 19 (23.2) | 23 (28.0) | 10 (12.2) | 30 (36.6) | 82 |
| Total (%) | 835 (31.5) | 648 (24.4) | 359 (13.5) | 813 (30.6) | 2655 |

Table 20: Visual Acuity of Operated cases by type of surgery (IOL)

| District | > 6/18 % | 6/18-6/60 % | 6/60-3/60 % | <3/60 % | Total |
|-------------|-------------|-------------|-------------|-----------|-------|
| Bhatinda | 154 (78.6) | 24 (12.2) | 3 (1.5) | 15 (7.7) | 196 |
| Cuddalore | 494 (72.1) | 133 (19.4) | 32 (4.7) | 26 (3.8) | 685 |
| Deoria | 115 (72.8) | 27 (17.1) | 9 (5.7) | 7 (4.4) | 158 |
| Ganjam | 100 (55.6) | 49 (27.2) | 7 (3.9) | 24 (13.3) | 180 |
| Gulbarga | 169 (78.2) | 29 (13.4) | 6 (2.8) | 12 (5.6) | 216 |
| Jhansi | 109 (61.9) | 40 (22.7) | 11 (6.3) | 16 (9.1) | 176 |
| Malda | 69 (73.4) | 20 (21.3) | 3 (3.2) | 2 (2.1) | 94 |
| Nagaur | 220 (60.4) | 76 (20.9) | 26 (7.1) | 42 (11.5) | 364 |
| Palakkad | 322 (86.8) | 29 (7.8) | 8 (2.2) | 12 (3.2) | 371 |
| Parbhani | 193 (72.8) | 47 (17.7) | 12 (4.5) | 13 (4.9) | 265 |
| Prakasam | 341 (72.4) | 93 (19.7) | 18 (3.8) | 19 (4.0) | 471 |
| Rajnandgaon | 169 (52.6) | 118 (36.8) | 22 (6.9) | 12 (3.7) | 321 |
| Shahdol | 116 (69.0) | 34 (20.2) | 9 (5.4) | 9 (5.4) | 168 |
| Solan | 177 (69.7) | 56 (22.0) | 12 (4.7) | 9 (3.5) | 254 |
| Surendrangr | 380 (68.2) | 97 (17.4) | 57 (10.2) | 23 (4.1) | 557 |
| Vaishali | 110 (70.1) | 35 (22.3) | 5 (3.2) | 7 (4.5) | 157 |
| Total (%) | 3238 (69.9) | 907 (19.6) | 240 (5.2) | 248 (5.4) | 4633 |

Visual Acuity of Operated cases by type of surgery

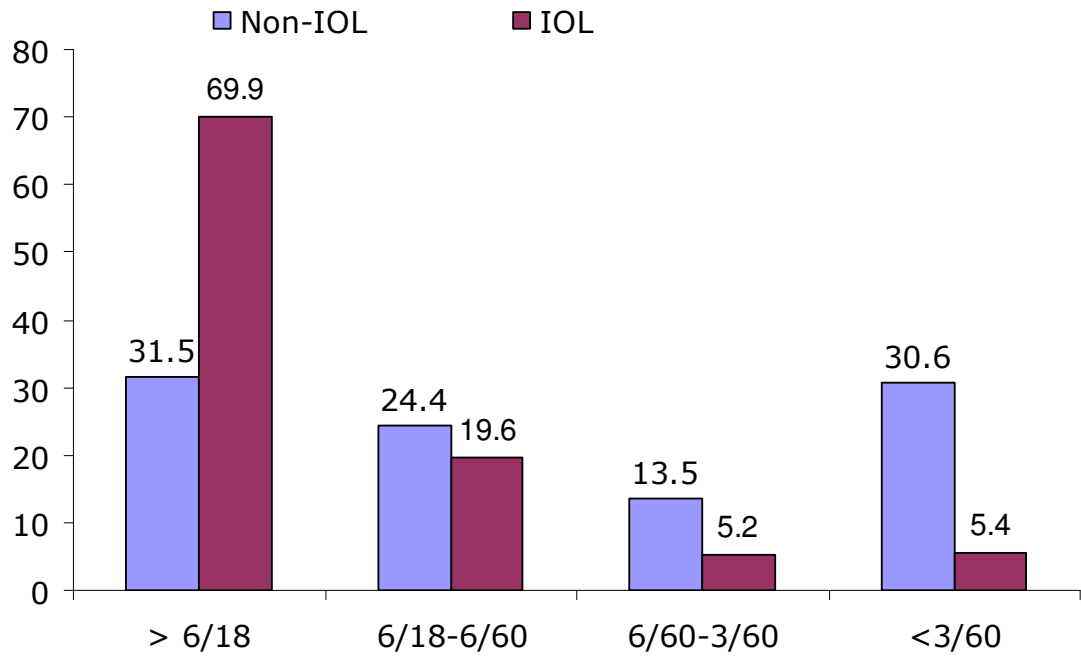


Table 21: Status of Current Spectacle Use by operated persons

| District | Using Currently (%) | Not using Currently (%) | Total |
|-------------|---------------------|-------------------------|-------|
| Bhatinda | 116 (44.4) | 145 (55.6) | 261 |
| Cuddalore | 118 (19.8) | 478 (80.2) | 596 |
| Deoria | 140 (65.4) | 74 (34.6) | 214 |
| Ganjam | 55 (25.6) | 160 (74.4) | 215 |
| Gulbarga | 138 (63.0) | 81 (37.0) | 219 |
| Jhansi | 175 (50.0) | 175 (50.0) | 350 |
| Malda | 94 (64.4) | 52 (35.6) | 146 |
| Nagaur | 186 (44.8) | 229 (55.2) | 415 |
| Palakkad | 111 (53.4) | 97 (46.6) | 208 |
| Parbhani | 186 (61.8) | 115 (38.2) | 301 |
| Prakasam | 187 (39.5) | 287 (60.6) | 474 |
| Rajnandgaon | 77 (22.1) | 271 (77.9) | 348 |
| Shahdol | 56 (29.6) | 133 (70.4) | 189 |
| Solan | 125 (47.0) | 141 (53.0) | 266 |
| Surendrangr | 149 (29.4) | 358 (70.6) | 507 |
| Vaishali | 72 (41.9) | 100 (58.1) | 172 |
| Total (%) | 1985 (40.1) | 2896 (59.3) | 4,881 |

Status of Current Spectacle Use by operated persons

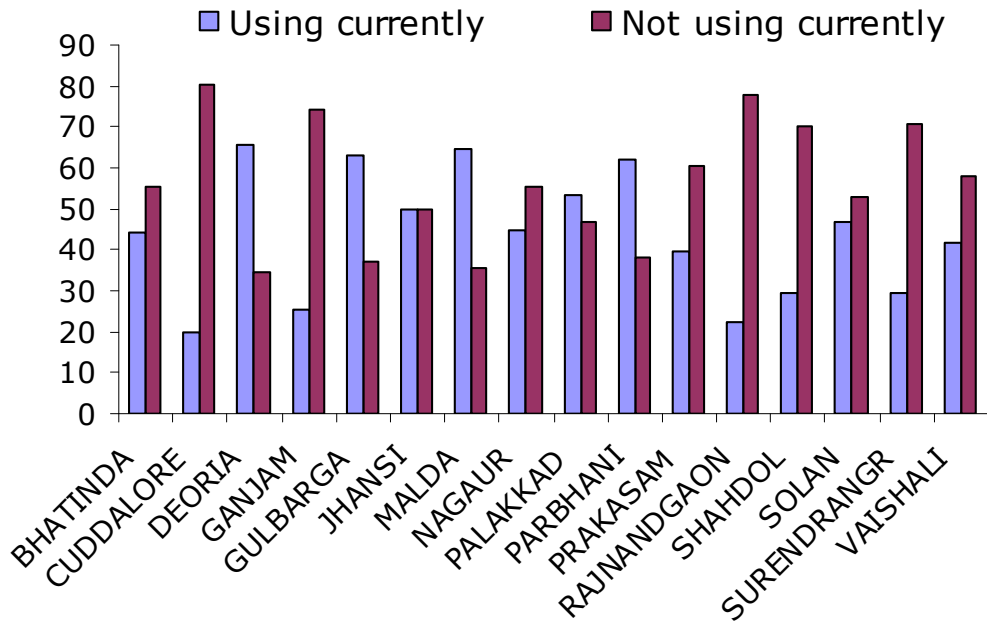
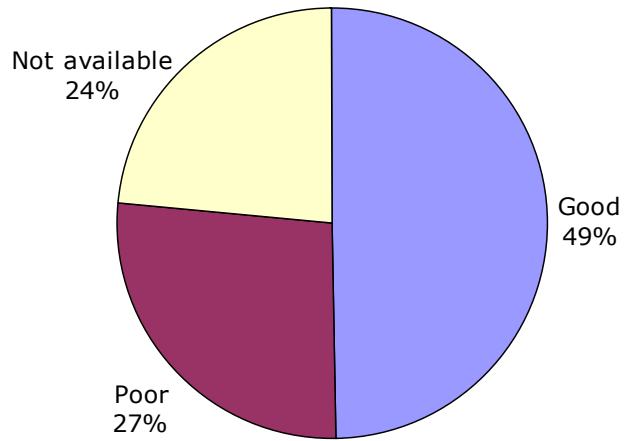


Table 22: Condition of spectacles and type of surgery

| District | NON-IOL | | | | IOL | | | |
|-------------|-------------|-----------|-------------------|-------|-----------|----------|-------------------|-------|
| | Good (%) | Poor (%) | Not available (%) | Total | Good (%) | Poor (%) | Not available (%) | Total |
| Bhatinda | 118 (62.1) | 22 (11.6) | 50 (26.3) | 190 | 29(19.9) | 6 (4.1) | 111(76.0) | 146 |
| Cuddalore | 86 (62.8) | 50 (36.5) | 1 (0.7) | 137 | 56(81.2) | 13(18.8) | 0 | 69 |
| Deoria | 23 (26.4) | 55 (63.2) | 9 (10.3) | 87 | 46(41.1) | 28(25.0) | 38(33.9) | 112 |
| Ganjam | 33 (31.7) | 21(20.2) | 50 (48.1) | 104 | 11(8.1) | 0 | 124(91.9) | 135 |
| Gulbarga | 85 (59.0) | 28(19.4) | 31 (21.5) | 144 | 98(61.3) | 3(1.9) | 59(36.9) | 160 |
| Jhansi | 146 (52.7) | 56(20.2) | 75 (27.1) | 277 | 35(22.7) | 3(1.9) | 116(75.3) | 154 |
| Malda | 50 (80.6) | 12(19.4) | 0 | 62 | 36(94.7) | 0 | 2(5.3) | 38 |
| Nagaur | 70 (32.3) | 99(45.6) | 48(22.1) | 217 | 94(26.3) | 28(7.8) | 235(65.8) | 357 |
| Palakkad | 45 (68.2) | 8(12.1) | 13(19.7) | 66 | 126(48.1) | 13(5.0) | 123(46.9) | 262 |
| Parbhani | 59 (50.9) | 35(30.2) | 22(19.0) | 116 | 95(53.1) | 20(11.2) | 64(35.8) | 179 |
| Prakasam | 101 (55.5) | 30(16.5) | 51(28.0) | 182 | 140(31.4) | 9(2.0) | 297(66.6) | 446 |
| Rajnandgaon | 61 (37.9) | 35(21.7) | 65(40.4) | 161 | 13(6.0) | 2(0.9) | 201(93.1) | 216 |
| Shahdol | 18 (20.7) | 46(52.9) | 23(26.4) | 87 | 21(15.3) | 2(1.5) | 114(83.2) | 137 |
| Solan | 96 (65.3) | 35(23.8) | 16(10.9) | 147 | 47(23.7) | 4(2.0) | 147(74.2) | 198 |
| Surendrangr | 112 (52.6) | 41(19.2) | 60(28.2) | 213 | 103(20.7) | 2(0.4) | 393(78.9) | 498 |
| Vaishali | 16 (26.7) | 29(48.3) | 15(25.0) | 60 | 23(45.1) | 5(9.8) | 23(45.1) | 51 |
| Total (%) | 1119 (49.7) | 602(26.8) | 529(23.5) | 2250 | 973(30.8) | 138(4.4) | 2047(64.8) | 3158 |

Condition of spectacles and type of surgery

Non IOL Surgery



IOL Surgery

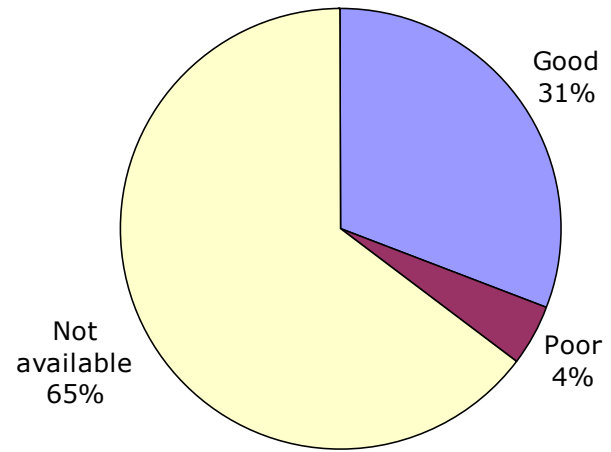


Table 23: Payment status for cataract surgical services (IOL and Non-IOL)

| District | NON-IOL | | | IOL | | |
|-------------|-------------|------------|-------|-------------|-------------|-------|
| | Free (%) | Paid (%) | Total | Free (%) | Paid (%) | Total |
| Bhatinda | 154 (75.1) | 51 (24.9) | 205 | 68 (44.7) | 84 (55.3) | 152 |
| Cuddalore | 191 (88.4) | 25 (11.6) | 216 | 452 (78.1) | 127 (21.9) | 579 |
| Deoria | 106 (86.9) | 16 (13.1) | 122 | 51 (40.8) | 74 (59.2) | 125 |
| Ganjam | 98 (81.7) | 22 (18.3) | 120 | 103 (75.2) | 34 (24.8) | 137 |
| Gulbarga | 107(70.9) | 44 (29.1) | 151 | 56 (38.6) | 89 (61.4) | 145 |
| Jhansi | 258 (83.5) | 51 (16.5) | 309 | 79 (61.7) | 49 (38.3) | 128 |
| Malda | 93 (94.9) | 5 (5.1) | 98 | 17 (25.4) | 50 (74.6) | 67 |
| Nagaur | 146 (67.3) | 71 (32.7) | 217 | 138 (51.7) | 129 (48.3) | 267 |
| Palakkad | 54 (73.0) | 20 (27.0) | 74 | 154 (49.7) | 156 (50.3) | 310 |
| Parbhani | 131(85.1) | 23 (14.9) | 154 | 133 (69.6) | 58 (30.4) | 191 |
| Prakasam | 86 (40.6) | 126 (59.4) | 212 | 167 (42.9) | 222 (57.1) | 389 |
| Rajnandgaon | 172 (92.0) | 15 (8.0) | 187 | 191 (71.5) | 76 (28.5) | 267 |
| Shahdol | 94 (94.0) | 6 (6.0) | 100 | 114 (84.4) | 21 (15.6) | 135 |
| Solan | 128 (81.5) | 29 (18.5) | 157 | 79 (40.1) | 118 (59.9) | 197 |
| Surendrangr | 175 (77.1) | 52 (22.9) | 227 | 316 (65.6) | 166 (34.4) | 482 |
| Vaishali | 59 (72.0) | 23 (28.0) | 82 | 21 (18.9) | 90 (81.1) | 111 |
| Total (%) | 2052 (78.0) | 579 (22.0) | 2631 | 2139 (58.1) | 1543 (41.9) | 3682 |

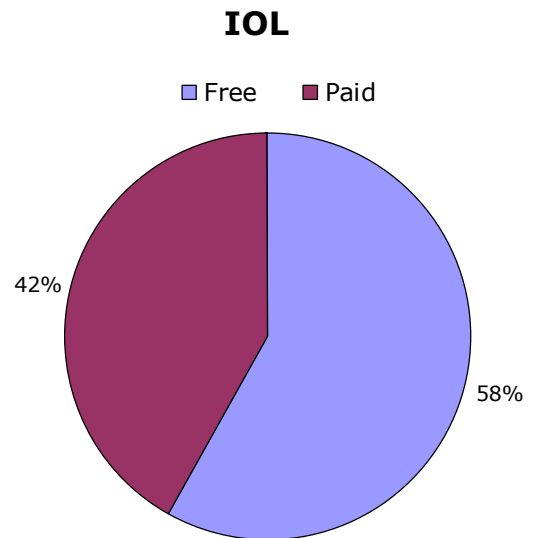
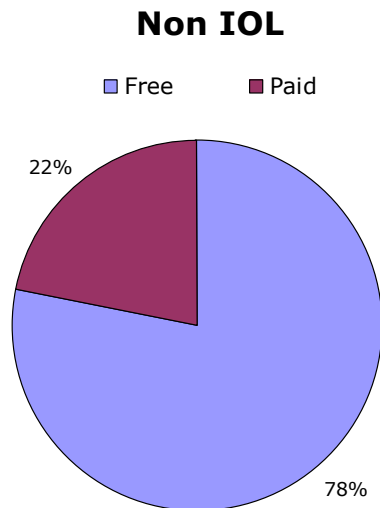


Table 24: Location where cataract surgery performed in different years

| District | 2002-2007 | | | | | 1997-2001 | | | | | < 1997 | | | | |
|-------------|-----------|-------|-------|---------|---------------|-----------|-------|-------|---------|---------------|--------|-------|-------|---------|---------------|
| | Govt % | NGO % | Pvt % | Camps % | Total Surg. N | Govt % | NGO % | Pvt % | Camps % | Total Surg. N | Govt % | NGO % | Pvt % | Camps % | Total Surg. N |
| Bhatinda | 15.2 | 4.3 | 40.8 | 39.8 | 211 | 10.8 | 3.6 | 36.9 | 48.6 | 111 | 17.2 | 0.9 | 37.9 | 43.1 | 58 |
| Cuddalore | 14.7 | 82.5 | 2.8 | 0.0 | 641 | 19.7 | 76.9 | 3.5 | 0.0 | 173 | 26.8 | 28.3 | 2.8 | 1.4 | 71 |
| Deoria | 48.3 | 17.4 | 31.5 | 2.8 | 178 | 56.5 | 11.8 | 21.2 | 10.6 | 85 | 73.3 | 1.2 | 20.0 | 0.0 | 15 |
| Ganjam | 60.6 | 7.8 | 14.0 | 17.6 | 193 | 34.1 | 6.1 | 15.9 | 43.9 | 82 | 54.5 | 0.0 | 13.6 | 31.8 | 22 |
| Gulbarga | 37.2 | 5.8 | 49.3 | 7.7 | 207 | 44.1 | 6.5 | 40.9 | 8.6 | 93 | 31.3 | 2.2 | 50.0 | 12.5 | 32 |
| Jhansi | 38.1 | 26.3 | 17.0 | 18.6 | 312 | 26.9 | 25.0 | 18.5 | 29.6 | 108 | 28.1 | 5.6 | 22.8 | 38.6 | 57 |
| Malda | 20.9 | 51.3 | 19.1 | 8.7 | 115 | 8.3 | 25.0 | 20.8 | 45.8 | 48 | 30.4 | 18.8 | 4.3 | 26.1 | 23 |
| Nagaur | 12.9 | 4.4 | 30.5 | 52.2 | 364 | 6.7 | 4.4 | 48.1 | 40.7 | 135 | 6.5 | 0.7 | 46.7 | 45.7 | 92 |
| Palakkad | 4.9 | 60.9 | 32.7 | 1.5 | 266 | 5.3 | 77.2 | 17.5 | 0.0 | 114 | 13.8 | 29.8 | 27.6 | 0.0 | 58 |
| Parbhani | 65.5 | 1.5 | 26.1 | 6.9 | 261 | 59.0 | 1.6 | 19.7 | 19.7 | 122 | 73.5 | 0.0 | 14.7 | 11.8 | 34 |
| Prakasam | 22.8 | 25.4 | 47.8 | 4.0 | 448 | 18.8 | 16.3 | 60.0 | 5.0 | 160 | 18.6 | 5.0 | 65.7 | 4.3 | 70 |
| Rajnandgaon | 19.8 | 32.9 | 7.8 | 39.6 | 359 | 14.2 | 39.8 | 5.3 | 40.7 | 113 | 14.8 | 9.7 | 7.4 | 37.0 | 27 |
| Shahdol | 58.6 | 17.2 | 10.2 | 14.0 | 186 | 33.3 | 14.8 | 9.3 | 42.6 | 54 | 18.5 | 14.8 | 3.7 | 48.1 | 27 |
| Solan | 33.3 | 1.2 | 41.6 | 23.9 | 243 | 45.6 | 0.0 | 23.3 | 31.1 | 103 | 48.2 | 1.9 | 17.9 | 30.4 | 56 |
| Surendrangr | 24.4 | 54.6 | 20.3 | 0.7 | 454 | 17.5 | 61.5 | 18.5 | 2.5 | 200 | 11.7 | 31.5 | 24.3 | 7.2 | 111 |
| Vaishali | 31.1 | 6.2 | 58.8 | 4.0 | 177 | 51.1 | 2.1 | 36.2 | 10.6 | 47 | 35.0 | 2.1 | 55.0 | 5.0 | 20 |
| Total | 28.4 | 31.3 | 25.7 | 14.6 | 4615 | 25.9 | 28.4 | 25.2 | 20.5 | 1748 | 25.0 | 11.2 | 28.6 | 21.1 | 773 |

Place of surgery in different years

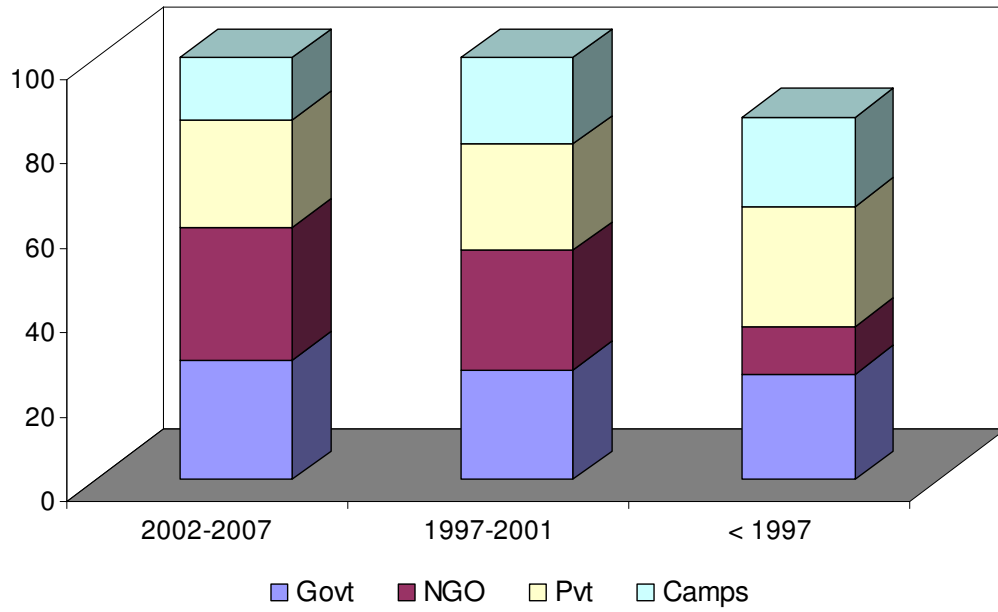


Table 25: Causes of blindness (presenting vision <6/60 better eye-NPCB definition)

| | RE | Cat | Uncorr. Aphakia | Cat sur compli | Phtisis | Trach | Other cor scar | Globe abnor | Glau | DR | AMD | Other post seg | Other | Undet. | Total |
|-------------|--------------|----------------|-----------------|----------------|-------------|-------------|----------------|-------------|-------------|------------|-------------|----------------|-------------|-------------|-------|
| Bhatinda | 0 | 72 (66.0) | 6 (5.5) | 2 (1.8) | 0 | 1 (0.9) | 23 (21.1) | 0 | 4 (3.7) | 0 | 0 | 0 | 1 (0.9) | 0 | 109 |
| Cuddalore | 8 (4.3) | 136 (72.7) | 14 (7.5) | 5 (2.7) | 1 (0.5) | 0 | 5 (2.7) | 0 | 2 (1.1) | 2 (1.1) | 3 (1.6) | 8 (4.3) | 2 (1.1) | 1 (0.5) | 187 |
| Deoria | 30 (9.9) | 256 (84.5) | 6 (2.0) | 2 (1.0) | 3 (0.99) | 0 | 5 (1.7) | 0 | 1 (0.3) | 0 | 0 | 0 | 0 | 0 | 303 |
| Ganjam | 2 (0.8) | 212 (86.2) | 21 (8.5) | 2 (0.8) | 2 (0.8) | 0 | 2 (0.8) | 0 | 3 (1.2) | 0 | 0 | 2 (0.8) | 0 | 0 | 246 |
| Gulbarga | 8 (4.1) | 158 (80.2) | 4 (2.0) | 2 (1.0) | 1 (0.5) | 0 | 4 (2.0) | 2 1.0 | 9 (4.6) | 1 (0.5) | 0 | 7 (3.6) | 0 | 1 (0.5) | 197 |
| Jhansi | 11 (4.2) | 160 (61.1) | 26 (9.9) | 7 (2.7) | 8 (3.1) | 0 | 20 (7.6) | 0 | 8 (3.1) | 0 | 1 (0.4) | 5 (1.9) | 14 (5.3) | 2 (0.8) | 262 |
| Malda | 10 (6.0) | 140 (83.8) | 7 (4.2) | 0 | 1 (0.6) | 0 | 1 (0.6) | 0 | 4 (2.4) | 0 | 0 | 2 (1.2) | 2 (1.2) | 0 | 167 |
| Nagaur | 4 (1.8) | 146 (67.0) | 8 (3.7) | 7 (3.2) | 2 (0.9) | 2 (0.9) | 25 (11.5) | 1 0.5 | 9 (4.1) | 2 (0.9) | 5 (2.3) | 6 (2.8) | 1 (0.5) | 0 | 218 |
| Palakkad | 0 | 71 (78.0) | 5 (5.5) | 0 | 0 | 0 | 1 (1.1) | 1 1.1 | 8 (8.8) | 0 0 | 1 (1.1) | 4 (4.4) | 0 | 0 | 91 |
| Parbhani | 7 (2.6) | 229 (83.3) | 5 (1.8) | 8 (2.9) | 1 (0.4) | 1 (0.4) | 6 (2.2) | 1 0.4 | 10 (3.6) | 1 (0.5) | 4 (1.5) | 0 | 1 (0.4) | 1 0.4 | 275 |
| Prakasam | 3 (1.4) | 190 (86.8) | 0 | 14 (6.4) | 0 | 0 | 2 (0.9) | 2 0.9 | 3 (1.4) | 0 | 0 | 2 (0.9) | 2 (0.9) | 1 (0.5) | 219 |
| Rajnandgaon | 5 (1.5) | 274 (81.3) | 19 (5.6) | 6 (1.8) | 3 (0.9) | 3 (0.9) | 6 (1.8) | 0 | 12 (3.6) | 0 | 2 (0.6) | 4 (1.2) | 2 (0.6) | 1 (0.3) | 337 |
| Shahdol | 5 (3.7) | 99 (73.9) | 9 (6.7) | 1 (0.8) | 0 | 1 (0.8) | 2 (1.5) | 0 | 5 (3.7) | 1 (0.8) | 5 (3.7) | 3 (2.2) | 2 (1.5) | 1 (0.8) | 134 |
| Solan | 1 (1.3) | 54 (67.5) | 0 | 14 (17.5) | 1 (1.3) | 0 | 3 (3.8) | 0 | 3 (3.8) | 0 | 0 | 0 | 3 (3.8) | 1 (1.3) | 80 |
| Surendrangr | 7 (4.6) | 88 (57.5) | 11 (7.2) | 0 | 4 (2.6) | 2 (1.3) | 9 (5.9) | 0 | 8 (5.2) | 0 | 9 (5.9) | 8 (5.2) | 7 (4.6) | 0 | 153 |
| Vaishali | 8 (3.2) | 216 (87.1) | 7 (2.8) | 0 | 0 | 0 | 3 (1.2) | 1 0.4 | 7 (2.8) | 0 | 1 (0.4) | 1 (0.4) | 2 0.8 | 2 (0.8) | 248 |
| Total | 109 (3.4) | 2501 (77.5) | 148 (4.6) | 70 (2.2) | 27 (0.8) | 10 (0.3) | 117 (3.6) | 8 0.3 | 96 (3.0) | 7 (0.2) | 31 (1.0) | 52 (1.6) | 39 1.2 | 11 (0.3) | 3226 |

Causes of Blindness (Vision < 6/60 better eye)

Cause of blindness

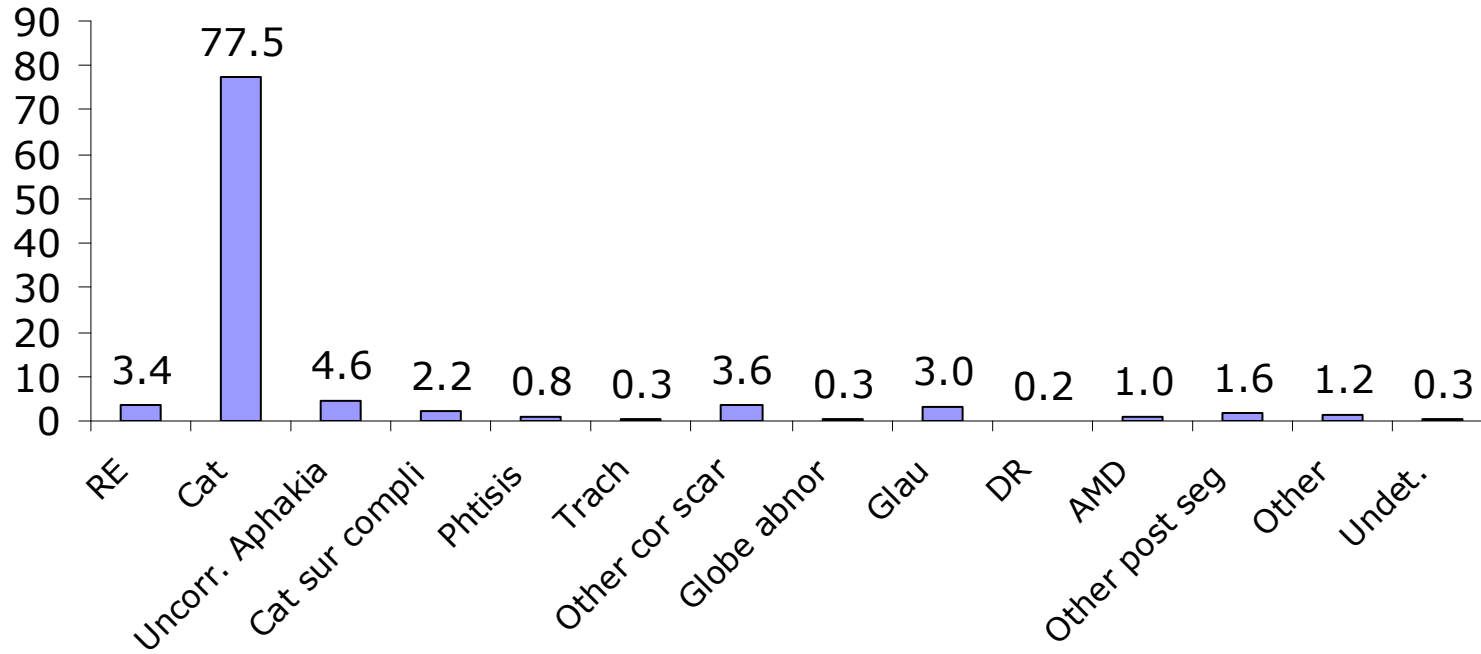


Table 26: Causes of low vision (presenting vision < 6/18-6/60 better eye)

| District | RE | Cat | Uncorr. Aphakia | Cat sur compli | Phtisis | Trach | Other cor scar | Globe abnor | Glau | DR | AMD | Other post seg | Other | Undet. | Total |
|-------------|----------------|----------------|-----------------|----------------|-------------|-------------|----------------|-------------|-------------|-------------|-------------|----------------|-------------|-------------|-------|
| Bhatinda | 28 (14.9) | 131 (69.7) | 14 (7.5) | 5 (2.7) | 0 | 0 | 3 (1.6) | 0 | 3 (1.6) | 1 (0.5) | 1 (0.5) | 0 | 1 (0.5) | 1 (0.5) | 188 |
| Cuddalore | 149 (27.3) | 348 (63.7) | 14 (2.6) | 3 (0.6) | 0 | 0 | 3 (0.6) | 0 | 8 (1.5) | 2 (0.4) | 4 (0.7) | 9 (1.7) | 6 (1.1) | 0 | 546 |
| Deoria | 332 (49.0) | 323 (47.7) | 14 (2.1) | 2 (0.3) | 2 (0.3) | 0 | 0 | 0 | 0 | 0 | 1 (0.2) | 2 (0.3) | 1 (0.2) | 0 | 677 |
| Ganjam | 18 (6.6) | 226 (83.4) | 18 (6.6) | 5 (1.9) | 0 | 0 | 1 (0.4) | 0 | 0 | 1 (0.4) | 1 (0.4) | 0 | 1 (0.4) | 0 | 271 |
| Gulbarga | 137 (34.9) | 222 (56.5) | 6 (1.5) | 5 (1.3) | 3 (0.8) | 1 (0.3) | 8 (2.0) | 0 | 3 (0.8) | 0 | 1 (0.3) | 5 (1.3) | 1 (0.3) | 1 (0.3) | 393 |
| Jhansi | 115 (29.6) | 221 (56.8) | 21 (5.4) | 1 (0.3) | 0 | 0 | 8 (2.1) | 0 | 3 (0.8) | 0 | 1 (0.3) | 3 (0.8) | 16 (4.1) | 0 | 389 |
| Malda | 226 (62.6) | 118 (32.7) | 9 (2.5) | 0 | 0 | 0 | 2 (0.6) | 0 | 4 (1.1) | 0 | 0 | 0 | 2 (0.6) | 0 | 361 |
| Nagaur | 33 (10.2) | 240 (73.9) | 7 (2.2) | 18 (5.5) | 0 | 0 | 11 (3.4) | 0 | 9 (2.8) | 1 (0.3) | 4 (1.2) | 2 (0.6) | 0 | 0 | 325 |
| Palakkad | 14 (8.4) | 128 (77.1) | 2 (1.2) | 0 | 0 | 0 | 2 (1.2) | 0 | 5 (3.01) | 6 (3.6) | 3 (1.8) | 5 (3.0) | 0 | 1 (0.6) | 166 |
| Parbhani | 82 (21.1) | 256 (65.8) | 15 (3.9) | 5 (1.3) | 0 | 0 | 8 (2.1) | 0 | 5 (1.3) | 0 | 10 (2.6) | 8 (2.1) | 0 | 0 | 389 |
| Prakasam | 156 (27.5) | 365 (64.4) | 3 (0.5) | 18 (3.2) | 0 | 0 | 4 (0.7) | 1 (0.2) | 9 (1.6) | 0 | 0 | 6 (1.1) | 4 (0.7) | 1 (0.2) | 567 |
| Rajnandgaon | 368 (46.8) | 372 (47.3) | 17 (2.2) | 3 (0.4) | 0 | 0 | 3 (0.4) | 0 | 11 (1.4) | 0 | 4 (0.5) | 6 (0.8) | 2 (0.3) | 0 | 786 |
| Shahdol | 232 (56.5) | 140 (34.1) | 16 (3.9) | 3 (0.7) | 0 | 2 (0.5) | 2 (0.5) | 0 | 1 (0.2) | 0 | 8 (2.0) | 6 (1.5) | 1 (0.2) | 0 | 411 |
| Solan | 125 (40.7) | 144 (46.9) | 4 (1.3) | 30 (9.8) | 0 | 0 | 1 (0.3) | 0 | 1 (0.3) | 0 | 1 (0.3) | 1 (0.3) | 0 | 0 | 307 |
| Surendrangr | 55 (17.5) | 207 (65.9) | 11 (3.5) | 4 (1.3) | 0 | 0 | 8 (2.6) | 0 | 1 (0.3) | 1 (0.3) | 16 (5.1) | 4 (1.3) | 7 (2.2) | 0 | 314 |
| Vaishali | 107 (20.1) | 405 (76.0) | 6 (1.1) | 1 (0.2) | 0 | 0 | 0 | 0 | 1 (0.2) | 2 (0.4) | 5 (0.9) | 4 (0.8) | 1 (0.2) | 1 (0.2) | 533 |
| Total | 2177 (32.9) | 3846 (58.1) | 177 (2.7) | 103 (1.6) | 5 (0.08) | 3 (0.05) | 64 (1.0) | 1 (0.02) | 64 (1.0) | 14 (0.2) | 60 (0.9) | 61 (0.9) | 43 (0.7) | 5 (0.08) | 6623 |

Cause of Low Vision (presenting vision < 6/18-6/60 in the better eye)

Cause of blindness

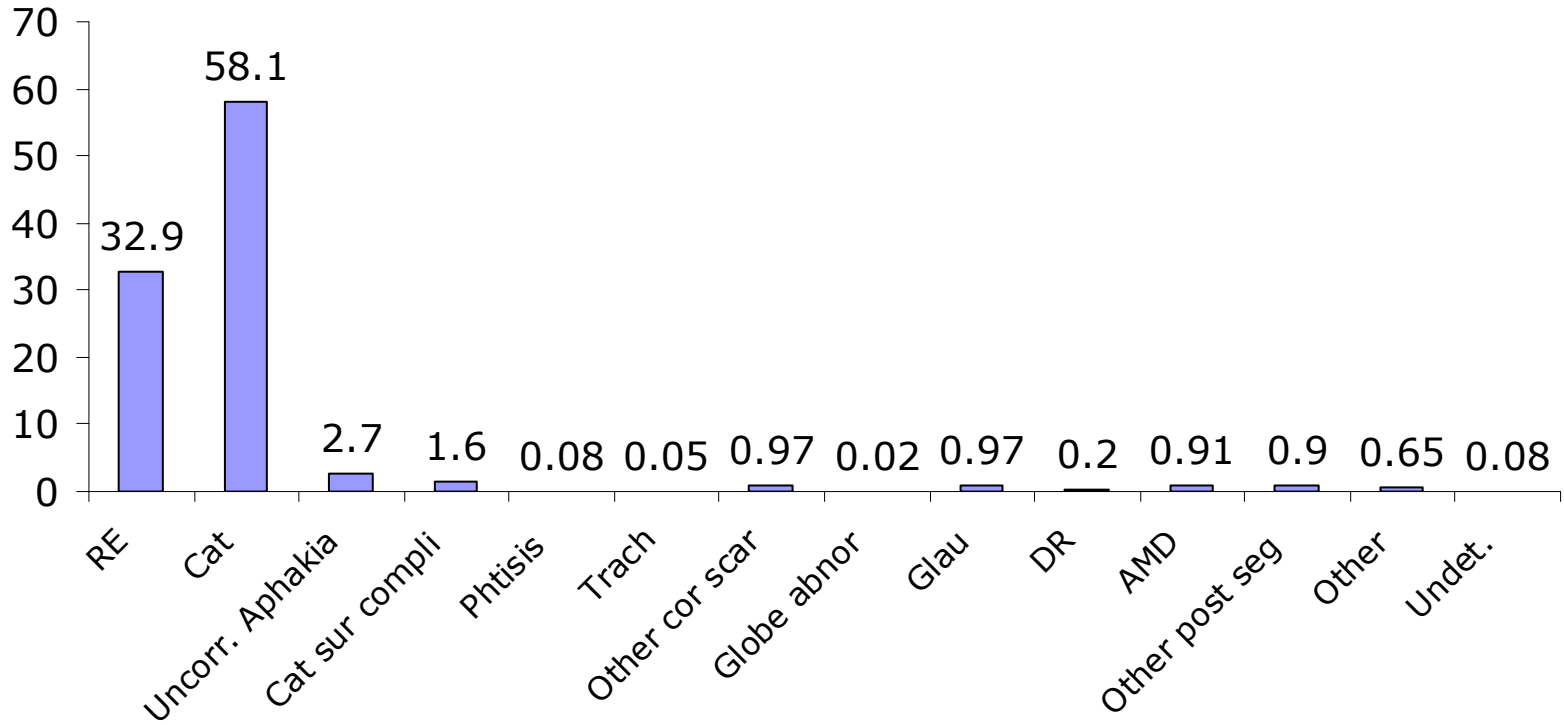


Table 27: Causes of Unilateral blindness (presenting vision < 6/60 in worst eye)

| District | RE | Cat | Uncorr. Aphakia | Cat sur compli | Phtisis | Trach | Other cor scar | Globe abnor | Glau | DR | AMD | Other post seg | Other | Undet. | Total |
|-------------|-------------|----------------|-----------------|----------------|--------------|------------|----------------|--------------|-------------|------------|------------|----------------|--------------|-------------|-------|
| BHATINDA | 3 (1.64) | 89 (48.6) | 13 (7.1) | 13 (7.1) | 13 (7.1) | 0 | 23 (12.6) | 0 | 12 (6.6) | 0 | 0 | 1 (0.6) | 16 (8.7) | 0 | 183 |
| CUDDALORE | 5 (2.2) | 117 (51.5) | 31 (13.7) | 15 (6.6) | 7 (3.1) | 0 | 19 (8.4) | 6 (2.6) | 6 (2.6) | 1 (0.4) | 0 | 11 (4.9) | 7 (3.1) | 2 (0.9) | 227 |
| DEORIA | 14 (9.6) | 96 (65.8) | 5 (3.4) | 5 (3.4) | 6 (4.1) | 0 | 12 (8.2) | 0 | 3 (2.1) | 1 (0.7) | 0 | 1 (0.7) | 3 (2.1) | 0 | 146 |
| GANJAM | 0 | 80 (71.4) | 9 (8.0) | 6 (5.4) | 3 (2.7) | 0 | 9 (8.0) | 0 | 3 (2.7) | 0 | 0 | 1 (0.9) | 1 (0.9) | 0 | 112 |
| GULBARGA | 10 (4.3) | 155 (67.1) | 15 (6.5) | 11 (4.8) | 7 (3.0) | 0 | 10 (4.3) | 1 (0.4) | 7 (3.0) | 1 (0.4) | 0 | 10 (4.3) | 4 (1.7) | 0 | 231 |
| JHANSI | 10 (4.5) | 126 (56.3) | 13 (5.8) | 6 (2.7) | 23 (10.3) | 0 | 15 (6.7) | 1 (0.5) | 8 (3.6) | 0 | 0 | 8 (3.6) | 14 (6.3) | 0 | 224 |
| MALDA | 4 (4.3) | 60 (63.8) | 4 (4.3) | 2 (2.1) | 5 (5.3) | 0 | 5 (5.3) | 0 | 1 (1.1) | 0 | 0 | 8 (8.5) | 5 (5.3) | 0 | 94 |
| NAGPUR | 8 (3.2) | 141 (56.9) | 11 (4.4) | 8 (3.2) | 15 (6.1) | 0 | 28 (11.3) | 5 (2.0) | 6 (2.4) | 0 | 2 (0.8) | 10 (4.0) | 13 (5.2) | 1 (0.4) | 248 |
| PALAKKAD | 0 | 67 (57.3) | 6 (5.1) | 2 (1.7) | 5 (4.3) | 0 | 9 (7.7) | 0 | 8 (6.8) | 3 (2.6) | 3 (2.6) | 11 (9.4) | 3 (2.6) | 0 | 117 |
| PARBHANI | 7 (3.4) | 127 (61.1) | 6 (2.9) | 8 (3.9) | 8 (3.9) | 0 | 29 (13.9) | 6 (2.9) | 8 (3.9) | 0 | 0 | 7 (3.4) | 1 (0.5) | 1 (0.5) | 208 |
| PRAKASAM | 10 (4.7) | 129 (60.6) | 4 (1.9) | 26 (12.2) | 2 (0.9) | 0 | 7 (3.3) | 3 (1.4) | 9 (4.2) | 1 (0.5) | 0 | 9 (4.2) | 13 (6.1) | 0 | 213 |
| RAJNANDGAON | 6 (7.9) | 36 (47.4) | 2 (2.6) | 1 (1.3) | 5 (6.6) | 0 | 5 (6.6) | 2 (2.6) | 2 (2.6) | 0 | 0 | 11 (14.5) | 6 (7.9) | 0 | 76 |
| SHAHDOL | 1 (1.1) | 42 (46.7) | 7 (7.8) | 7 (7.8) | 8 (8.9) | 0 | 8 (8.9) | 0 | 3 (3.3) | 0 | 0 | 3 (3.3) | 9 (10.0) | 2 (2.2) | 90 |
| SOLAN | 3 (2.9) | 55 (53.9) | 1 (1.0) | 11 (10.8) | 9 (8.8) | 0 | 9 (8.8) | 0 | 4 (3.9) | 0 | 0 | 4 (3.9) | 5 (4.9) | 1 (1.0) | 102 |
| SURENDRANGR | 6 (4.0) | 65 (43.1) | 20 (13.3) | 3 (2.0) | 15 (9.9) | 1 (0.7) | 9 (6.0) | 0 | 3 (2.0) | 0 | 1 (0.7) | 11 (7.3) | 17 (11.3) | 0 | 151 |
| VAISHALI | 8 (5.4) | 93 (62.8) | 5 (3.4) | 4 (2.7) | 6 (4.1) | 0 | 10 (6.8) | 1 (0.7) | 5 (3.4) | 0 | 2 (1.4) | 4 (2.7) | 5 (3.4) | 5 (3.4) | 148 |
| Total | 95 (3.7) | 1478 (57.5) | 152 (5.9) | 128 (5.0) | 137 (5.3) | 1 (4) | 207 (8.1) | 25 (0.97) | 88 (3.4) | 7 (0.3) | 8 (0.3) | 110 (4.3) | 122 (4.8) | 12 (0.5) | 2570 |

Causes of Unilateral Blindness/One Eye Blindness

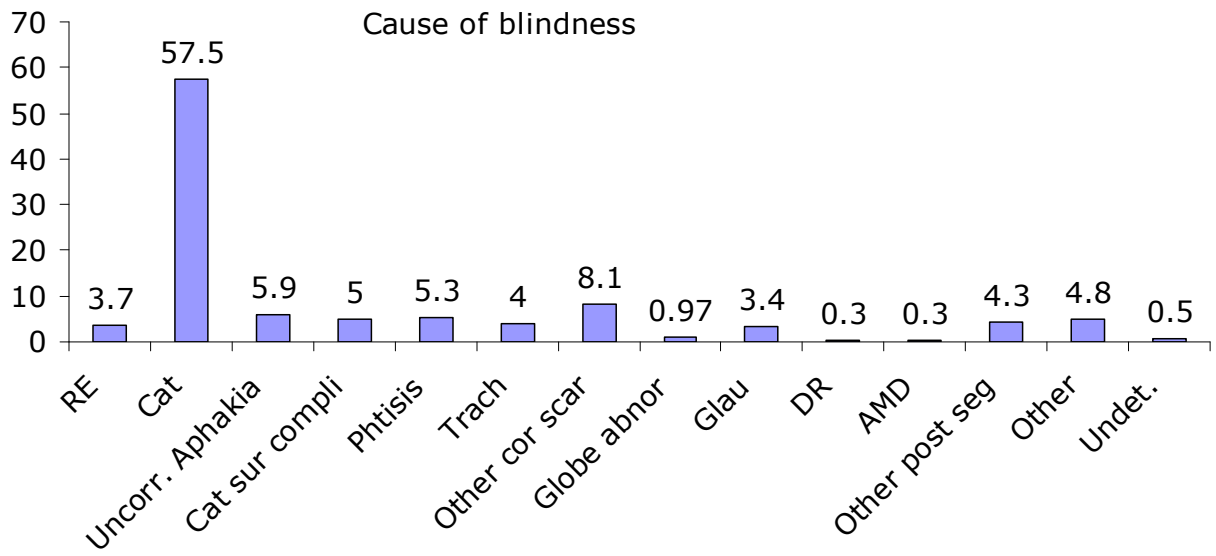


Table 28: Comparison of presenting and pinhole VA among all respondents

| Presenting | Pinhole | | | | | | | | Total |
|-------------|---------|------|-------------|------|-------------|------|--------|------|-------|
| | > 6/18 | % | < 6/18-6/60 | % | < 6/60-3/60 | % | < 3/60 | % | |
| > 6/18 | 55405 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 55505 |
| < 6/18-6/60 | 7758 | 54.7 | 6437 | 45.3 | 0 | 0 | 0 | 0 | 14195 |
| < 6/60-3/60 | 380 | 8.1 | 1696 | 36.1 | 2627 | 55.9 | 0 | 0 | 4703 |
| < 3/60 | 105 | 1.6 | 216 | 3.3 | 424 | 6.5 | 5813 | 88.6 | 6558 |
| Total | 63648 | 78.7 | 8349 | 10.3 | 3051 | 3.8 | 5813 | 7.2 | 80861 |

Table 29: Comparison of presenting and pinhole VA among all operated respondents (IOL surgery)

| Presenting | Pinhole | | | | | | | | Total |
|-------------|---------|------|-------------|------|-------------|------|--------|------|-------|
| | > 6/18 | % | < 6/18-6/60 | % | < 6/60-3/60 | % | < 3/60 | % | |
| > 6/18 | 3131 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 3131 |
| < 6/18-6/60 | 546 | 60.5 | 356 | 39.5 | 0 | 0 | 0 | 0 | 902 |
| < 6/60-3/60 | 31 | 13.1 | 79 | 33.3 | 127 | 53.6 | 0 | 0 | 237 |
| < 3/60 | 4 | 1.8 | 8 | 3.7 | 16 | 7.3 | 191 | 87.2 | 219 |
| Total | 3712 | 82.7 | 443 | 9.9 | 143 | 3.2 | 191 | 4.3 | 4489 |

Table 30: Comparison of presenting and pinhole VA among all operated respondents (Non IOL surgery)

| Presenting | Pinhole | | | | | | | | Total |
|-------------|---------|------|-------------|------|-------------|------|--------|------|-------|
| | > 6/18 | % | < 6/18-6/60 | % | < 6/60-3/60 | % | < 3/60 | % | |
| > 6/18 | 799 | 100 | 0 | | 0 | 0 | 0 | 0 | 799 |
| < 6/18-6/60 | 176 | 27.5 | 463 | 72.5 | 0 | 0 | 0 | 0 | 639 |
| < 6/60-3/60 | 53 | 20.7 | 114 | 44.5 | 189 | 73.8 | 0 | 0 | 256 |
| < 3/60 | 81 | 10.6 | 105 | 13.8 | 74 | 9.7 | 502 | 65.9 | 762 |
| Total | 1109 | 45.2 | 682 | 27.8 | 263 | 10.7 | 502 | 20.4 | 2456 |

Table 31: Comparison of Blindness Prevalence (VA < 6/60 in better eye) over the last decade

| State | District | Blindness Prevalence Rates (%) | | |
|------------------|---------------|--------------------------------|--------|-------|
| | | 1998 | 2001 | 2007 |
| Himachal Pradesh | Solan | | 5.4** | 3.2* |
| Punjab | Bhatinda | | 7.8** | 4.4* |
| Rajasthan | Nagaur | 24.9* | | 8.7* |
| Uttar Pradesh | Deoria | 19.3* | | 12.4* |
| Uttar Pradesh | Jhansi | 23.8* | | 10.6* |
| Bihar | Vaishali | | 6.0** | 9.4* |
| West Bengal | Malda | | 9.2** | 6.7* |
| Orissa | Ganjam | 19.9* | | 10.0* |
| Chhattisgarh | Rajnandgaon | | 12.4** | 13.2* |
| Madhya Pradesh | Shahdol | 21.0* | | 5.3* |
| Gujarat | Surendranagar | | 8.1** | 5.7* |
| Maharashtra | Parbhani | | 7.9* | 11.3* |
| Andhra Pradesh | Prakasam | 21.8* | 10.9** | 8.5* |
| Karnataka | Gulbarga | | 13.7** | 7.9* |
| Kerala | Palakkad | | 4.2** | 3.7* |
| Tamil Nadu | Cuddalore | | 15.3* | 7.3* |
| INDIA | | 18.4* | 11.5* | 8.0* |
| | | | 8.5** | 8.0 |

* Rapid Assessment / Rapid Assessment of Avoidable Blindness (VA Outdoor)

** Detailed Blindness Surveys (VA in Clinic)

Table 32: Barriers to cataract surgery (awareness related) among cataract blind persons

| States | District | Total | Unaware of cataract (%) | Told to wait for cataract to mature (%) | Believes it to be fate (%) | Fear of losing eyesight (%) | Fear of operation (%) |
|------------------|----------------|-------|-------------------------|---|----------------------------|-----------------------------|-----------------------|
| Andhra pradesh | Prakasam | 1066 | 167 (15.7) | 165 (15.5) | 2 (0.2) | 12 (1.1) | 24 (2.3) |
| Bihar | Vaishali | 1007 | 584 (58.0) | 97 (9.6) | 1 (0.1) | 14 (1.4) | 14 (1.4) |
| Chattisgarh | Rajnandgaon | 1214 | 259 (21.3) | 78 (6.4) | 27 (2.2) | 63 (5.2) | 207 (17.1) |
| Gujarat | Surenderanagar | 617 | 141 (22.9) | 109 (17.7) | 3 (0.5) | 10 (1.6) | 29 (4.7) |
| Himachal Pradesh | Solan | 403 | 240 (59.6) | 42 (10.4) | 0 (0.0) | 1 (0.2) | 8 (2.0) |
| Karnataka | Gulbarga | 1709 | 48 (2.8) | 304 (17.8) | 23 (1.3) | 51 (3.0) | 63 (3.7) |
| Kerala | Palakkad | 643 | 132 (20.5) | 28 (4.4) | 31 (4.8) | 5 (0.8) | 20 (3.1) |
| Madhya Pradesh | Shadol | 449 | 115 (25.6) | 30 (6.7) | 1 (0.2) | 14 (3.1) | 10 (2.2) |
| Maharashtra | Parbhani | 1730 | 307 (17.7) | 120 (6.9) | 30 (1.7) | 38 (2.2) | 95 (5.5) |
| Orissa | Ganjam | 1155 | 167 (14.5) | 9 (0.8) | 9 (0.8) | 21 (1.8) | 29 (2.5) |
| Punjab | Bhatinda | 422 | 87 (20.6) | 6 (1.4) | 1 (0.2) | 1 (0.2) | 14 (3.3) |
| Rajasthan | Nagaur | 819 | 54 (6.6) | 65 (7.9) | 5 (0.6) | 43 (5.3) | 59 (7.2) |
| Tamil Nadu | Cuddalore | 1425 | 337 (23.6) | 38 (2.7) | 2 (0.1) | 12 (0.8) | 75 (5.3) |
| Uttar Pradesh | Jhansi | 1127 | 395 (35.0) | 22 (2.0) | 4 (0.4) | 3 (0.3) | 3 (0.3) |
| Uttar Pradesh | Deoria | 2229 | 459 (20.6) | 215 (9.6) | 59 (2.6) | 34 (1.5) | 143 (6.4) |
| West Bengal | Malda | 701 | 243 (34.7) | 18 (2.6) | 1 (0.1) | 8 (1.1) | 11 (1.6) |
| All India | | 16716 | 3735 (22.3) | 1346 (8.1) | 199 (1.2) | 330 (2.0) | 804 (4.8) |

Table 33: Barriers to cataract surgery (service related) among cataract blind persons

| States | District | Total | Surgical Services not available (%) | Cannot afford operation (%) | Need not felt (%) | Old age & need not felt (%) |
|------------------|----------------|-------|-------------------------------------|-----------------------------|-------------------|-----------------------------|
| Andhra Pradesh | Prakasam | 1066 | 2 (0.2) | 168 (15.8) | 176 (16.5) | 74 (6.9) |
| Bihar | Vaishali | 1007 | 6 (0.6) | 97 (9.6) | 49 (4.9) | 26 (2.6) |
| Chattisgarh | Rajnandgaon | 1214 | 5 (0.4) | 23 (1.9) | 171 (14.1) | 61 (5.0) |
| Gujarat | Surenderanagar | 617 | 2 (0.3) | 11 (1.8) | 145 (23.5) | 46 (7.5) |
| Himachal Pradesh | Solan | 403 | 0 (0.0) | 10 (2.5) | 25 (6.2) | 36 (8.9) |
| Karnataka | Gulbarga | 1709 | 144 (8.4) | 297 (17.4) | 22 (1.3) | 75 (4.4) |
| Kerala | Palakkad | 643 | 10 (1.6) | 76 (11.8) | 25 (3.9) | 82 (12.8) |
| Madhya Pradesh | Shadol | 449 | 2 (0.4) | 29 (6.5) | 9 (2.0) | 65 (14.5) |
| Maharashtra | Parbhani | 1730 | 37 (2.1) | 163 (9.4) | 85 (4.9) | 106 (6.1) |
| Orissa | Ganjam | 1155 | 30 (2.6) | 103 (8.9) | 102 (8.8) | 30 (2.6) |
| Punjab | Bhatinda | 422 | 0 (0.0) | 41 (9.7) | 51 (12.1) | 94 (22.3) |
| Rajasthan | Nagaur | 819 | 10 (1.2) | 54 (6.6) | 225 (27.5) | 42 (5.1) |
| Tamil Nadu | Cuddalore | 1425 | 3 (0.2) | 164 (11.5) | 97 (6.8) | 103 (7.2) |
| Uttar Pradesh | Jhansi | 1127 | 24 (2.1) | 175 (15.5) | 40 (3.5) | 110 (9.8) |
| Uttar Pradesh | Deoria | 2229 | 54 (2.4) | 389 (17.5) | 164 (7.4) | 84 (3.8) |
| West Bengal | Malda | 701 | 12 (1.7) | 197 (28.1) | 42 (6.0) | 97 (13.8) |
| All India | | 16716 | 341 (2.0) | 1997 (11.9) | 1428 (8.5) | 1131 (6.8) |

Table 34: Barriers to cataract surgery (other reasons) among cataract blind persons

| States | District | Total | No one to accompany (%) | No time available/ other priorities (%) | One eye adequate vision (%) | Other disease contra-indicating operation (%) | Using other anti cataract medicines (%) | Others (%) |
|------------------|--------------|-------|-------------------------|---|-----------------------------|---|---|------------|
| Andhra Pradesh | Prakasam | 1066 | 126 (11.8) | 41 (3.8) | 19 (1.8) | 27 (2.5) | 1 (0.1) | 36 (3.4) |
| Bihar | Vaishali | 1007 | 27 (2.7) | 20 (2.0) | 18 (1.8) | 3 (0.3) | 3 (0.3) | 9 (0.9) |
| Chattisgarh | Rajnandgaon | 1214 | 110 (9.1) | 57 (4.7) | 36 (3.0) | 52 (4.3) | 2 (0.2) | 5 (0.4) |
| Gujarat | Surenderangr | 617 | 26 (4.2) | 19 (3.1) | 41 (6.6) | 7 (1.1) | 0 (0.0) | 5 (0.8) |
| Himachal Pradesh | Solan | 403 | 3 (0.7) | 9 (2.2) | 2 (0.5) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Karnataka | Gulbarga | 1709 | 165 (9.7) | 32 (1.9) | 108 (6.3) | 24 (1.4) | 1 (0.1) | 0 (0.0) |
| Kerala | Palakkad | 643 | 34 (5.3) | 37 (5.8) | 40 (6.2) | 44 (6.8) | 19 (3.0) | 1 (0.2) |
| Madhya Pradesh | Shadol | 449 | 20 (4.5) | 2 (0.4) | 12 (2.7) | 1 (0.2) | 0 (0.0) | 30 (6.7) |
| Maharashtra | Parbhani | 1730 | 245 (14.2) | 119 (6.9) | 133 (7.7) | 37 (2.1) | 0 (0.0) | 1 (0.1) |
| Orissa | Ganjam | 1155 | 107 (9.3) | 12 (1.0) | 32 (2.8) | 3 (0.3) | 0 (0.0) | 2 (0.2) |
| Punjab | Bhatinda | 422 | 6 (1.4) | 48 (11.4) | 40 (9.5) | 11 (2.6) | 1 (0.2) | 3 (0.7) |
| Rajasthan | Nagaur | 819 | 69 (8.4) | 25 (3.1) | 66 (8.1) | 63 (7.7) | 1 (0.1) | 11 (1.3) |
| Tamil Nadu | Cuddalore | 1425 | 253 (17.8) | 179 (12.6) | 28 (2.0) | 81 (5.7) | 4 (0.3) | 13 (0.9) |
| Uttar Pradesh | Jhansi | 1127 | 54 (4.8) | 15 (1.3) | 133 (11.8) | 15 (1.3) | 0 (0.0) | 17 (1.5) |
| Uttar Pradesh | Deoria | 2229 | 147 (6.6) | 75 (3.4) | 179 (8.0) | 7 (0.3) | 0 (0.0) | 0 (0.0) |
| West Bengal | Malda | 701 | 12 (1.7) | 5 (0.7) | 33 (4.7) | 3 (0.4) | 1 (0.1) | 8 (1.1) |
| All India | | 16716 | 1404 (8.4) | 695 (4.2) | 920 (5.5) | 378 (2.3) | 33 (0.2) | 141 (0.8) |

Table 35: Prevalence of Blindness in General Population (vision < 6/60 better eye)

| Assumption | Prev of Blind 50+ (< 6/60) | Population 50+ (2007) | No. of Blind 50+ (2007) | Total Population (2007) | No. of Blind All Ages | Prevalence of Blindness Total Population |
|---|----------------------------|-----------------------|-------------------------|-------------------------|-----------------------|--|
| Presenting Vision | | | | | | |
| 90% of blindness is seen in 50+ & 10% at other ages | 8.0% | 174,110,134 | 13,928,811 | 1129866154 | 15321692 | 1.36% |
| Pinhole Vision | | | | | | |
| 90% of blindness is seen in 50+ & 10% at other ages | 5.9% | 174,110,134 | 10272498 | 1129866154 | 11299748 | 1.0% |

Table 36: Prevalence of Blindness in General Population (vision < 3/60 better eye)

| Assumption | Prev of Blind 50+ (< 3/60) | Population 50+ (2007) | No. of Blind 50+ (2007) | Total Population (2007) | No. of Blind All Ages | Prevalence of Blindness Total Population |
|---|----------------------------|-----------------------|-------------------------|-------------------------|-----------------------|--|
| Presenting Vision | | | | | | |
| 90% of blindness is seen in 50+ & 10% at other ages | 3.6% | 174,110,134 | 6267965 | 1129866154 | 6964405 | 0.62% |
| Pinhole Vision | | | | | | |
| 90% of blindness is seen in 50+ & 10% at other ages | 3.0% | 174,110,134 | 5223304 | 1129866154 | 5745634 | 0.51% |

Suggestions

The Rapid Assessment of Avoidable Blindness study was conducted by the Community Ophthalmology Division of Dr R P Centre, All India Institute of Medical Sciences(AIIMS) New Delhi, with the active support of Regional stake holders of the programme on behalf of National Programme for Control of Blindness(NPCB).The raw data is stored for further analysis.

Suggestions and comments may be forwarded us.