



**National Programme for  
Control of Blindness**

**REPORT  
2001-2002**

**Rapid Assessment of Blindness**



सत्यमेव जयते

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## CONTENTS

	Page	
1	Preamble	1
2	Methodology	1
2.1	Objectives	1
2.2	Sample Size	1
2.3	Survey Design	1
2.4	Survey Design	2
2.5	Survey Teams	2
2.6	Survey Schedule	3
3	Observations	4
3.1	Basic Characteristics of Survey Population Surveyed	4
3.2	Prevalence of Blindness	4
3.3	Surgical Coverage of Cataract Blindness	5
3.4	Profile of Operated Patients	5
3.5	Visual Outcome after Surgery	7
4	Conclusions and Recommendations	9
<b>TABLES</b>		
1	Coverage of Survey Population (50+)	10
2	Sex Distribution of Survey Population (50+)	11
3	Age Distribution of Survey Population (50+)	12
4	Working Status of Survey Population (50+)	13
5	Prevalence (Persons) of Blindness and Low Vision in 50+ Population	14
6	Gender-wise Prevalence of Economic Blindness in 50+	16
7	Gender-wise Prevalence of Social Blindness in 50+	17
8	Age Specific Prevalence of Economic Blindness in 50+	18
9	Age Specific Prevalence of Social Blindness in 50+	19
10	Surgical Coverage (Persons) of Cataract Blindness	21
11	Surgical Coverage (Eyes) of Cataract Blindness	22
12	Distribution of Operated Cases by Type of Surgery	23
13	Distribution of Operated Cases by Year of Surgery	24
14	Gender-wise Distribution of Operated Cases in 50+	25
15	Distribution of Operated Cases by Age at Surgery	26
16	Distribution of Operated Cases by Place of Surgery	27
17	Place of Cataract Surgery by Year	28
18	Distribution of Operated Cases by Payment of Services	29
19	Distribution of ICCE Cases by Provision of Spectacles	30
20	Distribution of IOL Cases by Provision of Spectacles	31
21	Distribution of ICCE Cases by Status of Spectacles	32
22	Distribution of IOL Cases by Status of Spectacles	33
23	Visual Acuity of Operated Cases by Type of Surgery	34
24	Visual Acuity of Operated Cases by Place of Surgery	35
25	Visual Acuity of Operated Cases by Status of Spectacles	36
26	Visual Acuity of Operated Cases by Condition of Glasses	37
27	Visual Acuity of Operated Cases by Year of Surgery	38
28	Visual Acuity of ICCE Cases by Year of Surgery	39
29	Visual Acuity of IOL Cases by Year of Surgery	40
30	Presenting v/s Best Corrected Visual Acuity of Survey Population (50+)	41
31	Visual Outcome following ICCE Presenting v/s Best Corrected VA	42
32	Visual Outcome following ECCE/IOL Presenting v/s Best Corrected VA	43
	Annexure-I	44
	Annexure-II	45

## 1. PREAMBLE

Rapid Assessment of Blindness is a simple survey technique to assess the prevalence of blindness, surgical coverage of cataract blind and visual outcomes following cataract surgery. The methodology of rapid assessment was field tested in the state of Karnataka under Danish Assistance to National Programme for Control of Blindness. It was also undertaken in the seven states covered under World Bank Assisted Cataract Blindness Control Project, during the midterm review in 1997-98. The present study was part of end-line evaluation of the project.

## 2. METHODOLOGY

### 2.1 OBJECTIVES

- 1 To estimate the prevalence of blindness in 50 + population;
- 2 To estimate the cataract surgical coverage in the study population;
- 3 To study the profile of beneficiaries of cataract surgery, and
- 4 To assess visual outcome of cataract surgery.

### 2.2 SAMPLE SIZE

Following criteria were taken into account while calculating the sample size:

Prevalence of blindness :	As per 1986-89 survey
Confidence level :	90%
Sampling Error :	20%
Design Effect :	2
Response Rate :	85%

The sample size for each district was about 2000 subjects aged 50 years and above; 100 from 20 randomly selected clusters.

### 2.3 SURVEY DESIGN

The study was undertaken in 12 districts. These districts were randomly selected from those districts, which had average performance in the Project States of Andhra Pradesh, Maharashtra, Orissa, Tamilnadu, Rajasthan, Madhya Pradesh & Uttar Pradesh. One district each was also selected from newly formed states of Chattisgarh and Uttranchal.

## 2.4 SURVEY DESIGN

Survey instruments used in Rapid Assessment Surveys in Karnataka under Danish Assistance to NPCB were used with appropriate adaptations. Modified questionnaires is given at Annexure-I.

## 2.5 SURVEY TEAMS

Following criteria were used to identify survey organizations

- (a) Experience of having conducted similar surveys or investigations on public health problems, preferably blindness.
- (b) Has manpower for conducting surveys, which requires identifying blind persons on the basis of visual acuity & identifying cataract with the help of torch examination or direct ophthalmoscopy.
- (c) Have epidemiologist and ophthalmologist as supervisors.

All the survey teams were called for a consensus workshop in New Delhi to discuss the survey methodology and the guidelines for conducting survey. The guidelines for the survey are at Annexure II.

On the basis of above criteria following organizations were selected to undertake the survey:

S.N	NAME OF SURVEY ORGANIZATIONS	DISTRICT
1	Sarojini Devi Eye Hospital, Hyderabad.	Medak
2	MGM Medical College, Indore.	Dhar
3	Regional Institute of Ophthalmology, Ahmedabad.	Sehore
4	Mahatma Gandhi Institute of Medical Sciences, Sevagram.	Bilaspur
5	Lions NAB Eye Hospital, Miraj, Distt. Sangli, Maharashtra.	Yeotmal
6	Andhra Medical College, Vishakhapatnam.	Parbhani
7	Dr. R.P Centre for Ophthalmic Sciences, New Delhi.	Alwar
8	Indian Institute of Health Management Research, Jaipur.	Sirohi
9	JIPMER, Pondicherry.	Cuddalore
10	PGIME&R, Chandigarh.	Bareilly
11	J.N.Medical College, Aligarh Muslim University, Aligarh.	Barabanki
12	Christian Medical College, Ludhiana.	Hardwar

Each District Team comprised of the following:

(a)	Chief Surveyors	Ophthalmologist	1
	(from Survey Organization)	Epidemiologist	1
(b)	Distt.Coordination Team (from District)	Chief Medical Officer	1
		Distt. Eye Surgeon	1
		Distt. Programme Manager	1
(c)	Field Teams (3-4) (from District)	Field Supervisor	1
		Surveyors(Ophthalmic Assistants)	2
		Survey Assistant (Health Worker)	1

Each field team consisting of 4 persons covered one cluster in a day. All teams (3-4) worked simultaneously, thereby collecting data for entire district in 8-10 working days.

## 2.6 SURVEY SCHEDULE

The survey was conducted between December 2001 and April 2002. Data was fed in MS-Access and analyzed using EPI INFO. Data entry and analysis was completed in 4 weeks. Thus total time taken from consensus workshop to final report was 16 weeks. Following time schedule for each activity was suggested to the survey teams:

	<u>Working days</u>
<u>Preparation of survey</u>	10 days
Coordination with district officials	
Identification of clusters	
Logistic arrangements	
Procurement of supplies	
Identification of field team members	
<u>Training of Field Teams</u>	3 days
Classroom training	
Field oriented training	
<u>Data Collection</u>	10 days
Data Collection in 20 clusters	
Despatch of data forms	

Proforma from various survey teams were sent to MIS unit (NPCB), Nirman Bhawan, New Delhi for data entry, analysis and interpretation.

### **3. OBSERVATIONS**

#### **3.1 BASIC CHARACTERISTICS OF POPULATION SURVEYED**

The survey covered 12 districts in 9 States of India where World Bank Assisted Cataract Blindness Control Project was being implemented since 1994. Three districts (Dhar, Bilaspur and Parbhani) were predominantly tribal districts. The survey covered more than 24,000 persons aged 50+ years. 23446 persons were available for examination, with an overall response rate of 96.9% (Table 1).

Women outnumbered men except in Hardwar district of Uttranchal. Overall, 53.4% of persons examined were females (Table 2). The mean age of persons examined ranged between 59.5 to 62.8 years. Age-wise distribution of survey population indicated that 19.05% were above the age of 70 years (Table 3).

Visual disability may affect income generation capacity of the affected individuals thereby contributing to low family income. It was therefore relevant to obtain information on working status of survey population aged 50 years and above. It was observed that 40% persons were working and able to earn income. In addition, 41.3% persons, predominantly women, performed household work. Thus more than 80% of persons above 50 years of age were working (Table 4).

#### **3.2 PREVALENCE OF BLINDNESS**

The prevalence of bilateral social blindness (presenting visual acuity  $<3/60$  in the better eye) ranged between 1.98% to 10.51% in population aged 50 years and above. The overall prevalence of blindness with V A  $<3/60$  in the better eye was 4.67%. In addition, 6.79% subjects were economically blind and 20.96% had low vision. (Table 5).

##### **3.2.1 BLINDNESS BY GENDER**

The prevalence of bilateral economic blindness was higher in females as compared to males in all districts except Medak (Andhra Pradesh) . The difference was marked in Bilaspur (Chhattisgarh), Parbhani (Orissa) and Alwar (Rajasthan), where prevalence in females was significantly higher (Table 6). Prevalence of social blindness was 3.60 in males and 5.61 in females. Higher prevalence of social blindness in females was marked in Medak (Andhra Pradesh), Sehore (Madhya Pradesh), Bilaspur (Chhattisgarh), Parbhani (Orissa), Bareilly and Barabanki (Uttar Pradesh) (Table 7).

### 3.2.2 BLINDNESS BY AGE

Bilateral blindness in persons at economically productive age may have untoward socio-economic consequences. It was revealed that 1.91% persons aged between 50-54 years were having bilateral economic blindness. This prevalence was high (>3%) in Medak (Andhra Pradesh) and Cuddalore (Tamilnadu). Average prevalence of economic blindness in 55 to 59 year age group was 3.30% and increased further with advancing age, reaching 16.13% in persons aged 70 years and above (Table 8). Prevalence of social blindness showed similar picture increasing with advancing age (Table 9).

## 3.3 SURGICAL COVERAGE OF CATARACT BLINDNESS

### 3.3.1 COVERAGE (PERSONS)

Surgical coverage of cataract blind persons was calculated by the following:

$$\text{Coverage} = \frac{\text{No. of persons operated for cataract in 1 or both eyes}}{\text{No. of persons operated} + \text{No. of un-operated cataract blind persons}} \times 100$$

It was observed that the coverage ranged from 44.31% (Parbhani, Orissa) to 86.06% (Hardwar, Uttranchal). Average coverage of 69.66% indicated that 7 out of 10 socially blind persons had sought to services. (Table 10)

### 3.3.2 COVERAGE (EYES)

Surgical coverage of eyes was calculated by the following:

$$\text{Coverage} = \frac{\text{Eyes operated for cataract}}{\text{Eyes Operated} + \text{Unoperated eyes with cataract blindness}} \times 100$$

Average coverage of operable eyes was 47.84%. It was as low as 25.26% in Parbhani (Orissa) and as high as 65.17% in Hardwar (Uttranchal). (Table 11).

## 3.4 PROFILE OF OPERATED PATIENTS

A total of 3010 cataract operations were performed in the study population. In 892 (29.63%) cases, IOL implants were made. While less than 10% cases were implanted IOL in Bareilly and Barabanki in Uttar Pradesh, 51.68% of operated cases in Cuddalore (Tamilnadu) had opportunity for it. (Table 12). Operated cases were stratified according to year of surgery. There was steady rise in % IOL surgery from 4.31% before 1994 to 42.05% after 1999 (Tables 13).

### **3.4.1 OPERATED CASES BY GENDER**

It was observed that females out-numbered males among beneficiaries and this was evident in almost all the districts. However, proportionately, fewer (26.40%) females were implanted IOLs as compared to males (33.64%) (Table 14).

### **3.4.2 AGE AT SURGERY**

It was observed that at the time of surgery, 37.68% persons were operated before 60 years of age. This is very significant finding as it means that visual impairment due to cataract is affecting economically productive age group, leading the affected people to undergo surgery at age below 60 years. Cumulative % of operated cases below 65 years of age, was 58.11% (Tables 15).

### **3.4.3 PLACE AT SURGERY**

Eye care services were broadly grouped into two categories; fixed facilities and eye camps. The fixed facilities were further classified as Government, Voluntary (non-commercial) and private (commercial). Though camps are organized by govt. or voluntary organizations or as joint ventures, we grouped them together. Out of these four categories, private categories are paid services and other three are expected to provide free or highly subsidized services.

It was observed that camps (45.8%) were the major source for cataract surgery, though there was large variation from district to district. While only 14.17% of treatment seekers went to eye camps in Medak (Andhra Pradesh), majority of persons depended on camp services in Yeotmal, Bilaspur, Dhar & Alwar. Fixed Government facilities accounted for 8.45 to 51.18%. While hospitals of voluntary organizations treated 13.05% of all beneficiaries, private (paid) services were sought by 18.28% beneficiaries though the variation was wide. While only 1% beneficiaries in Parbhani (Orissa) went to private surgeons, nearly 36% in Hardwar (Uttanchal) preferred private services (Table 16). There was no significant changes in proportion of cases operated in various facilities (Table 17).

### **3.4.4 PAYMENT FOR CATARACT SERVICES**

It was observed that 74.55% of operated cases were provided free surgical services and 6.53% patients described services as partially free, possibly because they had to pay for medicines, spectacles etc. Proportion of free surgeries varied from 51.28% in Bareilly to 93.81% in Parbhani (Table 18).

### **3.4.5 PROVISION OF SPECTACLES**

Norms and guidelines under the National Programme for Control of Blindness



emphasize post-operative care and follow-up services to ensure best possible visual restoration. There is provision to provide free aphakic glasses to the poor. Ideally, the spectacles should be prescribed by undertaking refraction 4 to 6 weeks after surgery.

It was observed that about 7.7% operated cases following conventional ICCE surgeries were neither provided free glasses nor did they purchase. They would, in all probability, remain aphakic blind. Of those who were given free glasses, majority of them received + 10D standard glasses at the time of discharge. Only 19.63% beneficiaries were provided free glasses after 4-6 weeks of surgery but it was difficult to determine whether refraction was performed or they were also given + 10D glasses (Table 19). In IOL surgery, power of lens should ideally be determined before surgery through biometry. However, there may be need for corrective glasses in some cases. It was found that nearly half of patients neither got nor purchased glasses. Nearly 1/3 (32.58%) beneficiaries purchased glasses (Table 20).

#### **3.4.6 USE OF SPECTACLES**

Besides providing or purchasing glasses, it is essential to provide good quality glasses and use them for better visual outcome. At the time of surgery, more than 80% of ICCE as well as IOL cases were using glasses. Remaining persons did not use glasses as these were broken (Table 21 & 22).

### **3.5 VISUAL OUTCOME AFTER SURGERY**

The only measure of success of cataract surgery is restoring sight of the affected person. The quality of life and productivity would be expected to improve if the physical disability is taken care of. Visual outcome thus is the parameter for measuring the effect of surgical intervention.

Visual outcome was assessed by visual acuity in the operated eye. Any surgery resulting into V A <3/60 in the operated eye would not be considered as successful. Post-operative visual acuity is dependent on many factors: successful surgery, post-operative care and follow up, use of aphakic glasses, presence of other ocular morbidity (particularly age related disorders like glaucoma, macular degeneration) etc. Some factors could indirectly influence visual outcomes like place of surgery (fixed facility v/s camps) etc. Rapid survey did not include detailed eye examination to identify other ocular disorders. However, parameters that may have a role in visual outcome are described below.

#### **3.5.1 VISUAL OUTCOME BY TYPE OF SURGERY**

The results confirmed superiority of IOL implants over conventional surgery. While such questions cannot be answered without controlling confounding

factors, the survey results did indicate better visual outcome in those who were implanted IOLs. There was significant difference in proportion of operated cases with V A <3/60 in those who were operated by ICCE (19.89%) as compared to IOL surgery (6.38%). Higher percent of individuals had normal (V A >6/18) vision following IOL surgery (57.03%) as compared to those who underwent ICCE (33.03%) (Table 23).

### **3.5.2 VISUAL OUTCOME BY PLACE OF SURGERY**

It was observed that about 14% of operated cases had post-operative acuity <3/60 in the operated eye. There was significant difference in unfavourable outcomes following camp surgery (19.78%). Poor outcome (VA <3/60) in fixed facilities were lower in Government (9.78%), Voluntary (10.68%) and Private hospitals (9.11%) (Table 24).

### **3.5.3 VISUAL OUTCOME BY USE OF SPECTACLES**

There was strong relationship between visual outcome and use of corrective glasses. Among those who were using glasses, only 11% had V A <3/60, whereas it was as high as 41% among those whose glasses were broken and thus were not using them (Tables 25).

### **3.5.4 VISUAL OUTCOME BY QUALITY OF GLASSES**

Failure rate dropped to 8.44% if the operated subjects were using good quality glasses. 17.18% of operated patients could not see properly because of poor glasses and among non-users of glasses, the failure rate was as high as 31.34% (Table 26).

### **3.5.5 VISUAL OUTCOME BY YEAR OF SURGERY**

Irrespective of type of surgery, failure rate (Post-operative V A <3/60) was 25.17% among those operated before 1994, 16.46% among these operated between 1994 & 1998 and 12.66% among those who were operated after 1998. This reduction in failure rate was evident in conventional (25.59% to 17.92%) as well as IOL surgery (15.79% to 5.24%) (Table 27 to 29).

### **3.5.6 EFFECT OF BEST CORRECTION**

Examination of individuals by pinhole was undertaken to find out if there would be any effect of providing best corrective spectacles on prevalence of blindness and visual outcome. It was observed that prevalence of social blindness could be reduced from 5.88% to 4.48% and economic blindness from 5.66% to 2.83% if best corrective glasses were provided (Table 30). Failure rate could be reduced following ICCE surgery from 24.74% to 15.49% and following IOL implantation from 8.20% to 5.56% if best corrective glasses were provided after refraction. (Table 31 & 32).

#### 4. CONCLUSIONS AND RECOMMENDATIONS

The trend in prevalence of blindness is one of the parameters that can be used to assess progress in the implementation of National Programme for Control of Blindness. The goal with which NPCB was launched in 1976 was to reduce the prevalence of blindness from 1.4% to 0.3%. As the project aimed at controlling cataract induced blindness, it was relevant to specifically undertake Rapid Assessment in 50+ population.

Prevalence of social blindness of 4.67% in 50+ population is marginally lower as compared to Rapid Assessment - 1998 survey when it was 5.24%. In spite of women beneficiaries outnumbering men, the prevalence of blindness continued to be higher in women indicating that much more needs to be done in this regard. The prevalence of blindness in 50-59 year age group was less than 2%, which shows decline as compared to 1986 figures when it ranged between 3.04 and 7.63.

The surgical coverage of cataract blindness continues to be 70% indicating that since 1998 there has not been further increase. Thus 30% of population continues to be underserved and efforts need to be made to reach this population.

There has been significant increase in proportion of cataract operations performed with IOL implants. The figures indicated in the survey are in conformity with reported figures. However, the finding that male beneficiaries are given preference in IOL implantation, indicates that the situation needs to be rectified

Performance of cataract surgery in eye camps continues to be high as per survey results. As this is a cross-sectional study, it may not be reflecting current status. Further efforts are required to curtail surgeries in camps situation.

It appears that Government of India guidelines regarding prescription of glasses after performing refraction 4-6 weeks of surgery is not being abided by as only 1/5 of the patients following conventional cataract surgery were given glasses as per guidelines. This has resulted into untoward visual outcome in spite of undertaking Cataract Surgery. In addition, there was no provision of giving second pair of glasses, if the first pair got broken. This issue needs to be looked into.

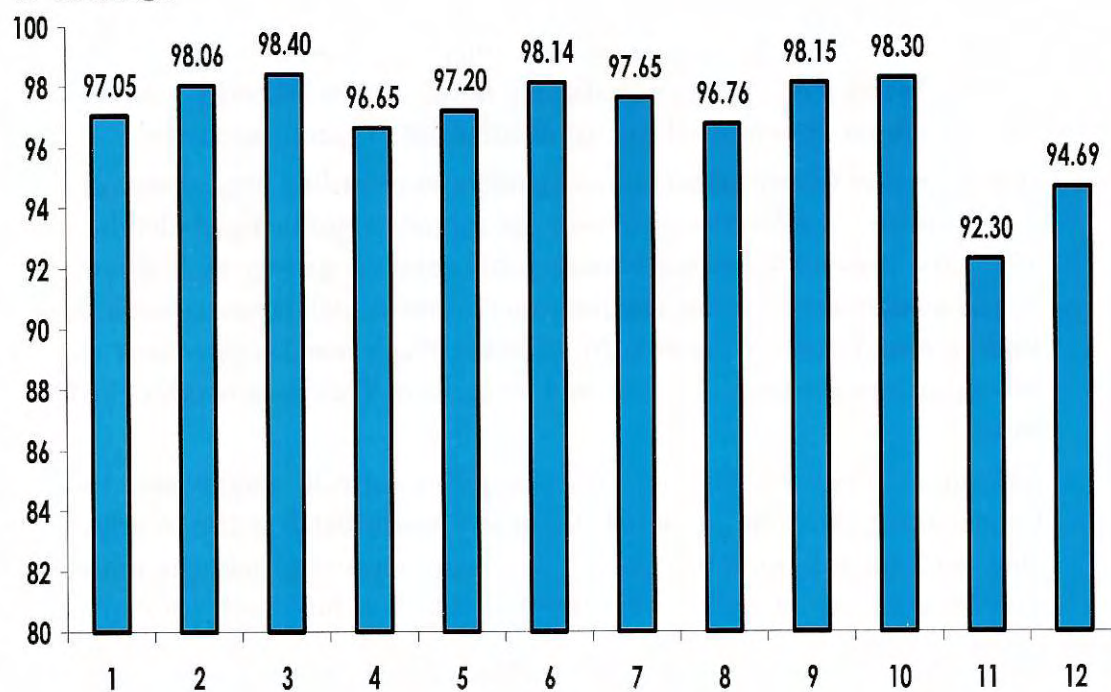
The survey confirms superior outcome following IOL surgery and therefore Government efforts to promote IOL surgery is justified. It is also clearly evident that outcome following IOL surgery has been improving over the years which may be as a result of good quality training, supply of high-tech equipments and improvement in eye care infrastructure.

The survey also clearly indicated that further reduction in prevalence of blindness and improvement in visual outcome is possible, if follow-up services are strengthened.

**Table 1: Coverage of Survey Population (50+)**

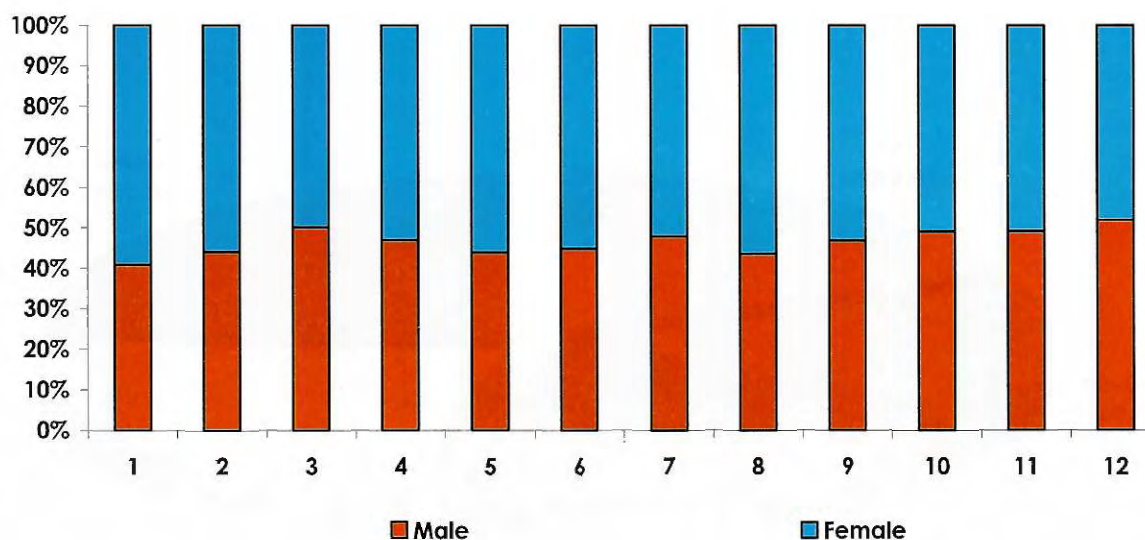
S.No.	State	District	Persons aged 50+		%
			Surveyed	Examined	Examined
1	Andhra Pradesh	Medak	2003	1944	97.1
2	Madhya Pradesh	Dhar	2008	1969	98.1
3		Sehore	2004	1972	98.4
4	Chattisgarh	Bilaspur	2000	1933	96.7
5	Maharashtra	Yeotmal	2000	1944	97.2
6	Orissa	Parbhani	2042	2004	98.1
7	Rajasthan	Alwar	2085	2036	97.6
8		Sirohi	2008	1943	96.8
9	Tamilnadu	Cuddalore	1997	1960	98.1
10	Uttar Pradesh	Bareilly	2002	1968	98.3
11		Barabanki	2000	1846	92.3
12	Uttranchal	Hardwar	2035	1927	94.7
<b>Total</b>			<b>24184</b>	<b>23446</b>	<b>96.9</b>

**% Coverage**



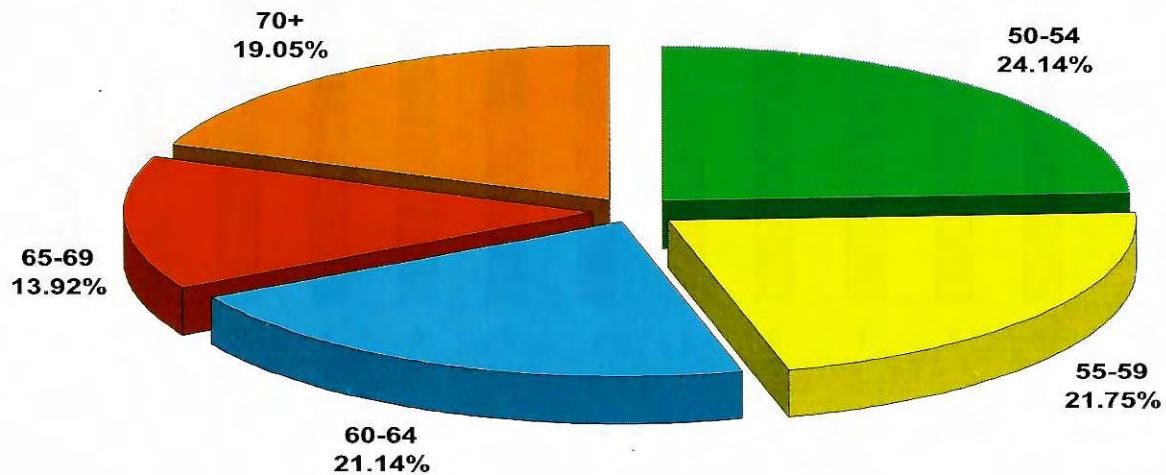
**Table 2: Sex Distribution of Survey Population**

S.No.	District	Male		Female	
		No.	%	No.	%
1	Medak	817	40.8	1186	59.2
2	Dhar	885	44.1	1123	55.9
3	Sehore	1002	50.0	1002	50.0
4	Bilaspur	939	47.0	1061	53.1
5	Yeotmal	877	43.9	1123	56.2
6	Parbhani	915	44.8	1127	55.2
7	Alwar	999	47.9	1086	52.1
8	Sirohi	875	43.6	1133	56.4
9	Cuddalore	935	46.8	1062	53.2
10	Bareilly	981	49.0	1021	51.0
11	Barabanki	981	49.1	1019	51.0
12	Hardwar	1055	51.8	980	48.2
	<b>Total</b>	<b>11261</b>	<b>46.6</b>	<b>12923</b>	<b>53.4</b>



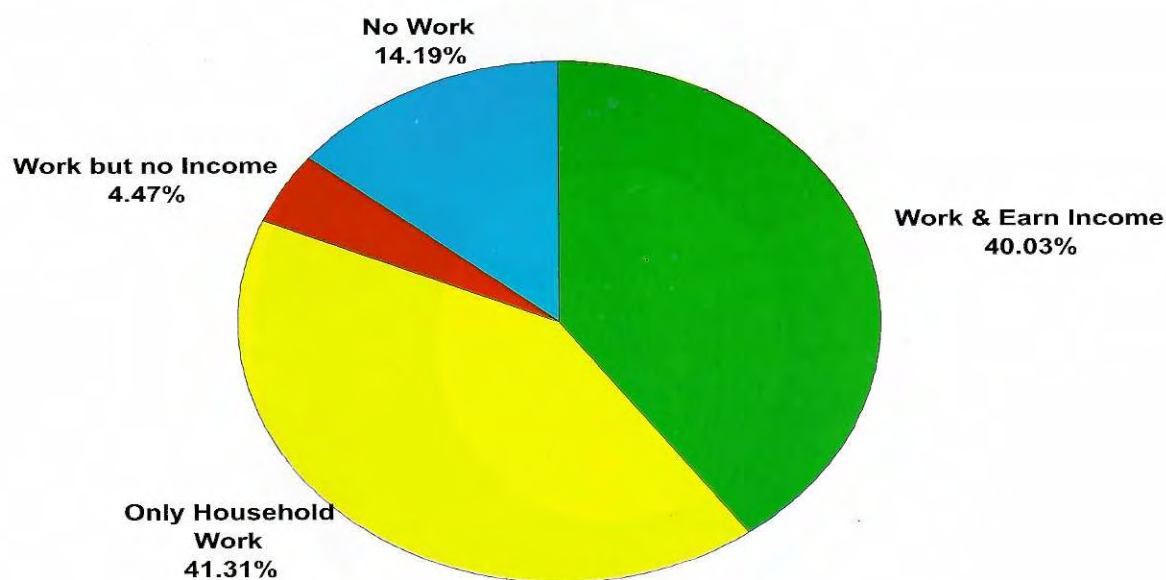
**Table 3: Age Distribution of Survey Population (50+)**

S.No.	District	Age in years					Total	Mean Age
		50-54	55-59	60-64	65-69	70+		
1	Medak	520	353	492	284	353	2002	61.2
2	Dhar	479	516	474	252	287	2008	59.5
3	Sehore	580	421	312	262	428	2003	61.3
4	Bilaspur	523	448	540	238	251	2000	60.2
5	Yeotmal	460	349	461	315	414	1999	61.2
6	Parbhani	307	554	470	320	390	2041	61.5
7	Alwar	471	436	390	312	476	2085	62.2
8	Sirohi	683	462	320	206	333	2004	59.6
9	Cuddalore	524	470	462	221	320	1997	60.0
10	Bareilly	441	473	376	274	437	2001	61.2
11	Barabanki	378	414	393	329	486	2000	62.8
12	Hardwar	468	362	420	351	429	2030	62.8
<b>Total</b>		<b>5834</b>	<b>5258</b>	<b>5110</b>	<b>3364</b>	<b>4604</b>	<b>24170</b>	<b>61.2</b>
<b>%</b>		<b>24.14</b>	<b>21.75</b>	<b>21.14</b>	<b>13.92</b>	<b>19.05</b>	<b>100.00</b>	



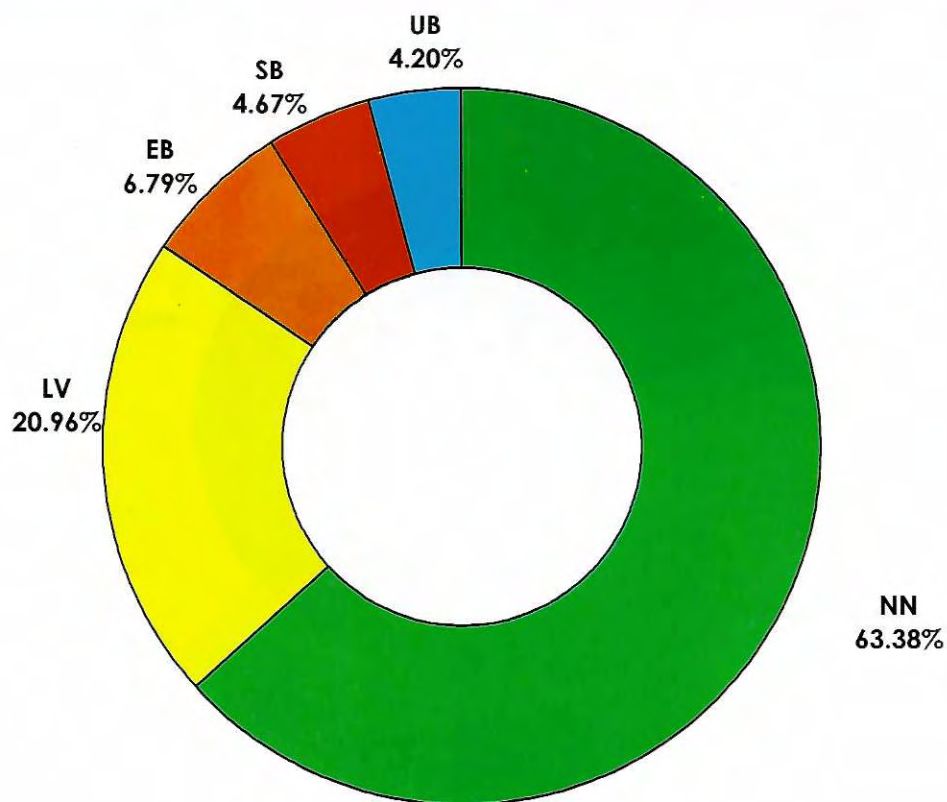
**Table 4: Working Status of Survey Population (50+)**

S.No.	District	Work and Earn Income	Only Household Work	Work but no Income	No Work	Total
1	Medak	924	597	4	478	2003
2	Dhar	875	848	151	134	2008
3	Sehore	639	805	252	308	2004
4	Bilaspur	1213	579	44	164	2000
5	Yeotmal	794	1042	21	143	2000
6	Parbhani	798	790	182	272	2042
7	Alwar	637	876	162	410	2085
8	Sirohi	645	1136	19	208	2008
9	Cuddalore	703	1040	5	249	1997
10	Bareilly	695	834	27	446	2002
11	Barabanki	665	790	210	335	2000
12	Hardwar	1094	654	3	284	2035
<b>Total</b>		<b>9682</b>	<b>9991</b>	<b>1080</b>	<b>3431</b>	<b>24184</b>
<b>%</b>		<b>40.03</b>	<b>41.31</b>	<b>4.47</b>	<b>14.19</b>	<b>100.00</b>



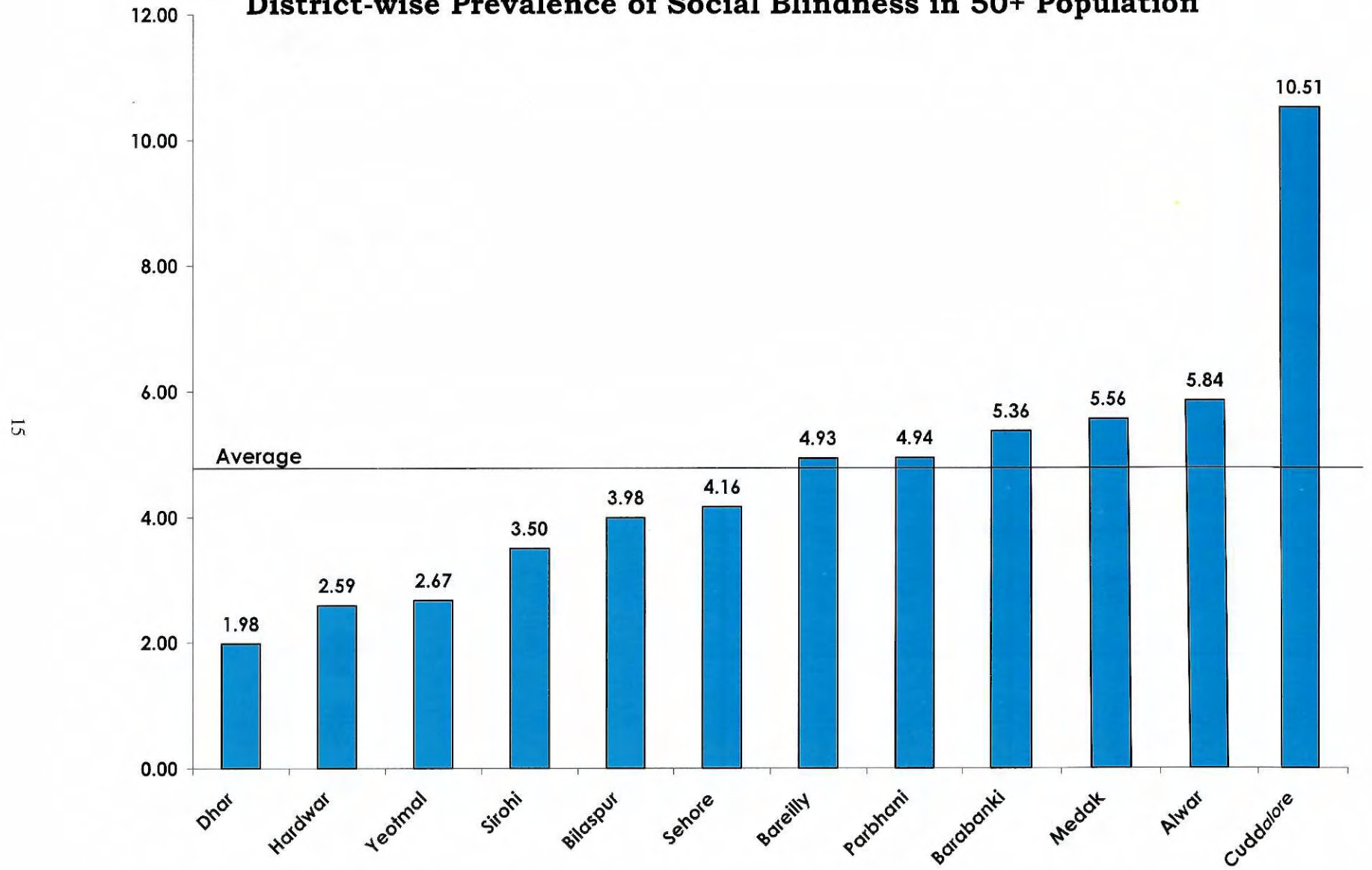
**Table 5: Prevalence (Persons) of Blindness and Low Vision in 50+ Population**

S. No.	District	Normal Vision (NN)	Low Vision (LV)	Economic Blindness (EB)	Social Blindness (SB)	Unilateral Blindness (UB)	Total	% Social Blind
1	Medak	1048	537	143	108	108	1944	5.56
2	Dhar	1444	308	115	39	63	1969	1.98
3	Sehore	1430	251	132	82	77	1972	4.16
4	Bilaspur	1196	488	104	77	68	1933	3.98
5	Yeotmal	993	768	99	52	32	1944	2.67
6	Parbhani	1279	327	240	99	59	2004	4.94
7	Alwar	1365	303	127	119	122	2036	5.84
8	Sirohi	1357	381	79	68	58	1943	3.50
9	Cuddalore	992	411	257	206	94	1960	10.51
10	Bareilly	1381	331	81	97	78	1968	4.93
11	Barabanki	1125	411	99	99	112	1846	5.36
12	Hardwar	1248	398	117	50	114	1927	2.59
<b>Total</b>		<b>14858</b>	<b>4914</b>	<b>1593</b>	<b>1096</b>	<b>985</b>	<b>23446</b>	<b>4.67</b>
<b>%</b>		<b>63.38</b>	<b>20.96</b>	<b>6.79</b>	<b>4.67</b>	<b>4.20</b>	<b>100.00</b>	



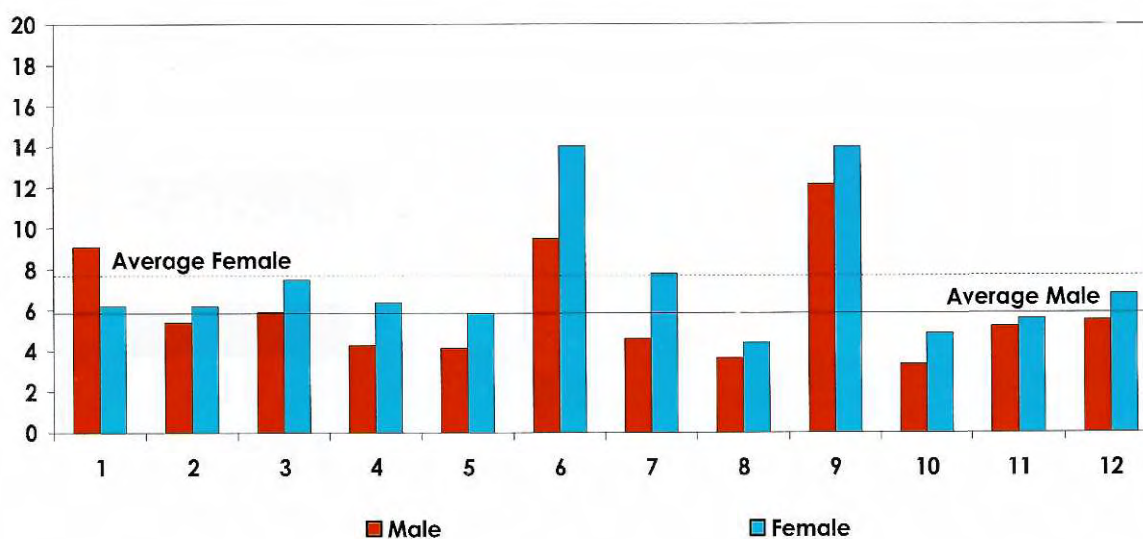


### District-wise Prevalence of Social Blindness in 50+ Population



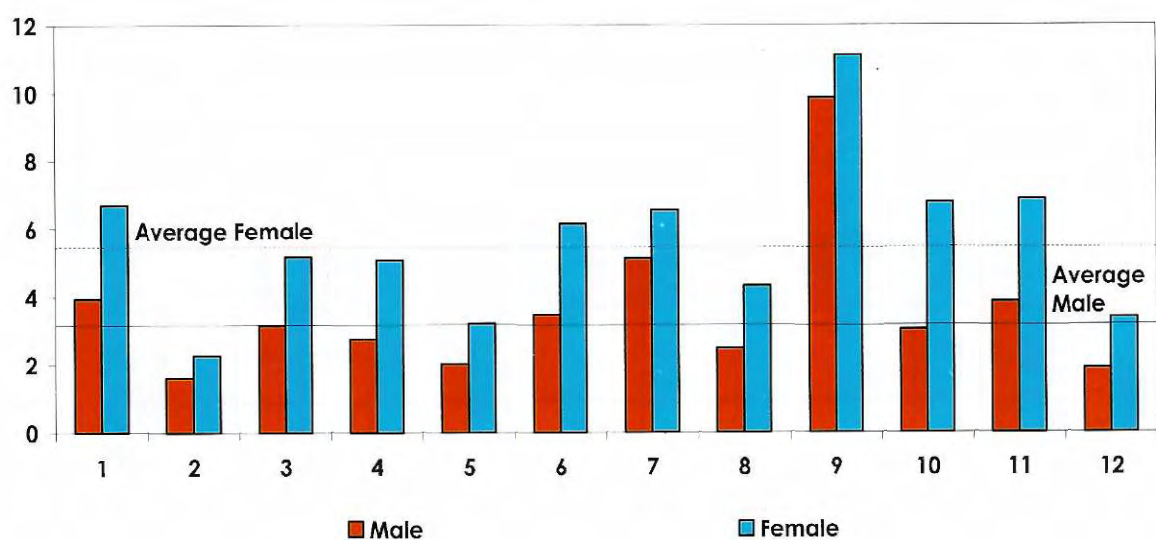
**Table 6: Gender-wise Prevalence of Economic Blindness in 50+**

S. No.	District	Male			Female		
		No. Examined	No. Blind	Prevalence	No. Examined	No. Blind	Prevalence
1	Medak	791	72	9.10	1152	71	6.16
2	Dhar	868	47	5.41	1101	68	6.18
3	Sehore	984	58	5.89	988	74	7.49
4	Bilaspur	909	39	4.29	1024	65	6.35
5	Yeotmal	847	35	4.13	1097	64	5.83
6	Parbhani	896	85	9.49	1108	155	13.99
7	Alwar	979	45	4.60	1057	82	7.76
8	Sirohi	847	31	3.66	1096	48	4.38
9	Cuddalore	915	111	12.13	1045	146	13.97
10	Bareilly	959	32	3.34	1009	49	4.86
11	Barabanki	910	47	5.16	936	52	5.56
12	Hardwar	1007	55	5.46	920	62	6.74
<b>Total</b>		<b>10912</b>	<b>657</b>	<b>6.02</b>	<b>12533</b>	<b>936</b>	<b>7.47</b>



**Table 7: Gender-wise Prevalence of Social Blindness in 50+**

S. No.	District	Male			Female		
		No. Examined	No. Blind	Prevalence	No. Examined	No. Blind	Prevalence
1	Medak	791	31	3.92	1152	77	6.68
2	Dhar	868	14	1.61	1101	25	2.27
3	Sehore	984	31	3.15	988	51	5.16
4	Bilaspur	909	25	2.75	1024	52	5.08
5	Yeotmal	847	17	2.01	1097	35	3.19
6	Parbhani	896	31	3.46	1108	68	6.14
7	Alwar	979	50	5.11	1057	69	6.53
8	Sirohi	847	21	2.48	1096	47	4.29
9	Cuddalore	915	90	9.84	1045	116	11.10
10	Bareilly	959	29	3.02	1009	68	6.74
11	Barabanki	910	35	3.85	936	64	6.84
12	Hardwar	1007	19	1.89	920	31	3.37
		<b>10912</b>	<b>393</b>	<b>3.60</b>	<b>12533</b>	<b>703</b>	<b>5.61</b>



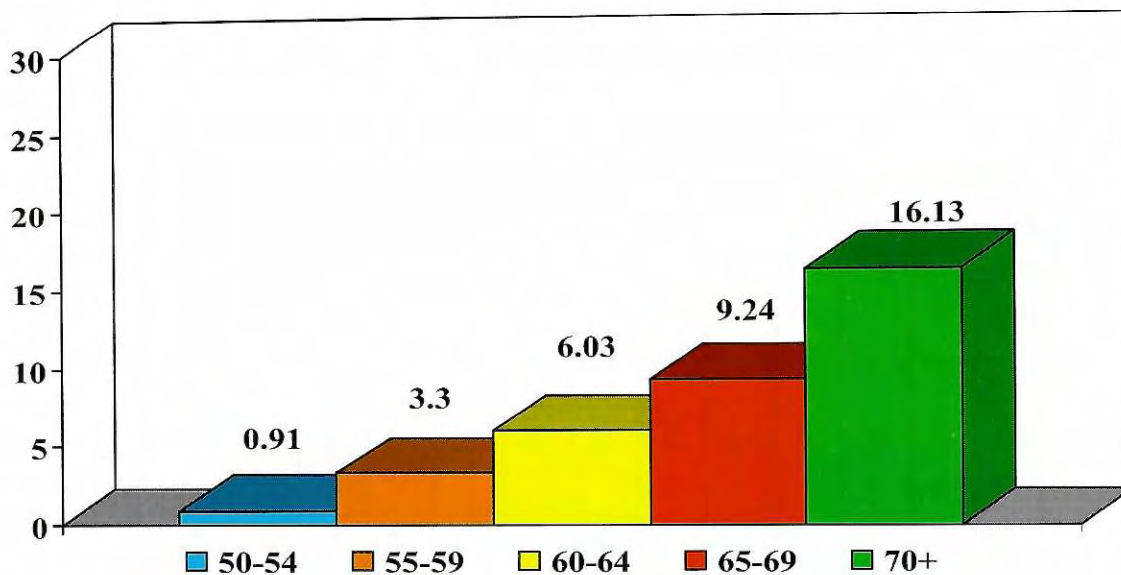
**Table 8: Age Specific Prevalence of Economic Blindness in 50+**

S. No.	District	50-54 years			55-59 years			60-64 years			65-69 years			70 years & above		
		No. Examined	No. Blind	%	No. Examined	No. Blind	%	No. Examined	No. Blind	%	No. Examined	No. Blind	%	No. Examined	No. Blind	%
1	Medak	506	19	3.75	340	14	4.12	478	29	6.07	276	31	11.23	342	50	14.62
2	Dhar	476	5	1.05	506	8	1.58	458	25	5.46	247	27	10.93	282	50	17.73
3	Sehore	573	6	1.05	412	10	2.43	308	16	5.19	256	23	8.98	422	77	18.25
4	Bilaspur	508	11	2.17	432	6	1.39	516	33	6.40	229	28	12.23	248	26	10.48
5	Yeotmal	456	6	1.32	345	6	1.74	443	9	2.03	294	26	8.84	405	52	12.84
6	Parbhani	305	3	0.98	547	29	5.30	457	56	12.25	317	40	12.62	377	112	29.71
7	Alwar	463	5	1.08	427	11	2.58	377	13	3.45	302	25	8.28	467	73	15.63
8	Sirohi	673	2	0.30	435	4	0.92	307	10	3.26	197	15	7.61	327	48	14.68
9	Cuddalore	521	36	6.91	461	56	12.15	451	62	13.75	214	37	17.29	313	66	21.09
10	Bareilly	436	2	0.46	470	5	1.06	371	6	1.62	266	11	4.14	424	57	13.44
11	Barabanki	335	9	2.69	378	9	2.38	362	16	4.42	295	7	2.37	456	58	12.72
12	Hardwar	449	5	1.11	345	10	2.90	398	22	5.53	323	27	8.36	407	52	12.78
<b>Total</b>		<b>5701</b>	<b>109</b>	<b>1.91</b>	<b>5098</b>	<b>168</b>	<b>3.30</b>	<b>4926</b>	<b>297</b>	<b>6.03</b>	<b>3216</b>	<b>297</b>	<b>9.24</b>	<b>4470</b>	<b>721</b>	<b>16.13</b>

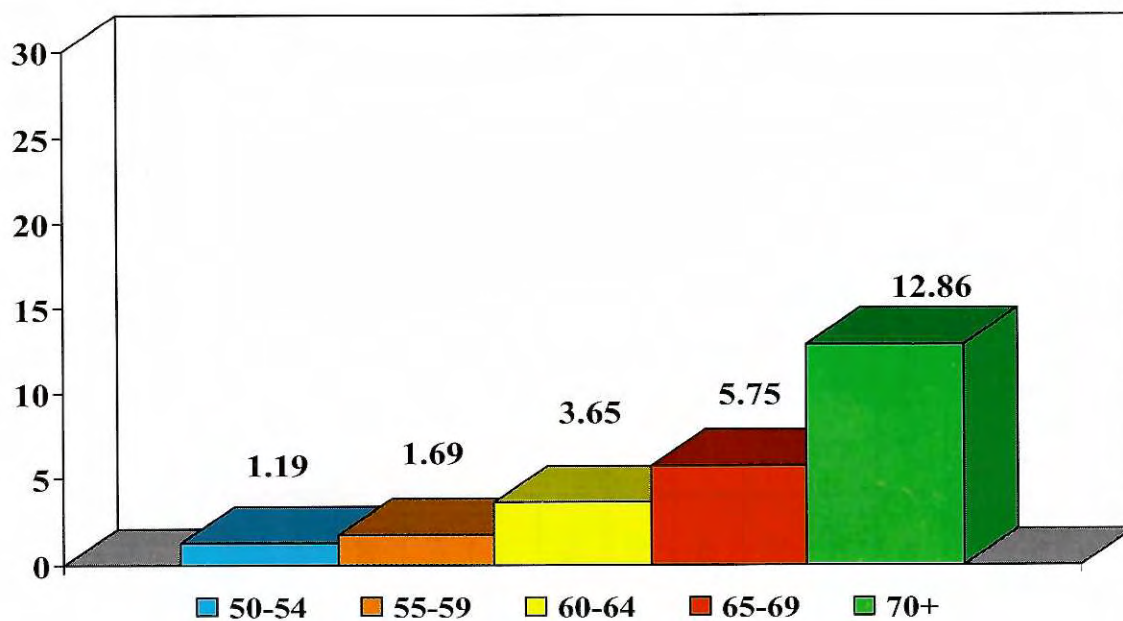
**Table 9: Age Specific Prevalence of Social Blindness in 50+**

S. No.	District	50-54 years			55-59 years			60-64 years			65-69 years			70 years & above		
		No. Examined	No. Blind	%	No. Examined	No. Blind	%	No. Examined	No. Blind	%	No. Examined	No. Blind	%	No. Examined	No. Blind	%
1	Medak	506	4	0.79	340	9	2.65	478	24	5.02	276	26	9.42	342	44	12.87
2	Dhar	476	1	0.21	506	6	1.19	458	5	1.09	247	3	1.21	282	24	8.51
3	Sehore	573	3	0.52	412	5	1.21	308	12	3.90	256	12	4.69	422	50	11.85
4	Bilaspur	508	6	1.18	432	7	1.62	516	23	4.46	229	11	4.80	248	30	12.10
5	Yeotmal	456	3	0.66	345	2	0.58	443	5	1.13	294	7	2.38	405	35	8.64
6	Parbhani	305	1	0.33	547	7	1.28	457	21	4.60	317	19	5.99	377	51	13.53
7	Alwar	463	6	1.30	427	4	0.94	377	10	2.65	302	21	6.95	467	78	16.70
8	Sirohi	673	3	0.45	435	0	0.00	307	9	2.93	197	8	4.06	327	48	14.68
9	Cuddalore	521	29	5.57	461	28	6.07	451	41	9.09	214	38	17.76	313	70	22.36
10	Bareilly	436	3	0.69	470	5	1.06	371	3	0.81	266	12	4.51	424	73	17.22
11	Barabanki	335	7	2.09	378	8	2.12	362	15	4.14	295	19	6.44	456	50	10.96
12	Hardwar	449	2	0.45	345	5	1.45	398	12	3.02	323	9	2.79	407	22	5.41
<b>Total</b>		<b>5701</b>	<b>68</b>	<b>1.19</b>	<b>5098</b>	<b>86</b>	<b>1.69</b>	<b>4926</b>	<b>180</b>	<b>3.65</b>	<b>3216</b>	<b>185</b>	<b>5.75</b>	<b>4470</b>	<b>575</b>	<b>12.86</b>

### Age Specific Prevalence of Economic Blindness in 50+

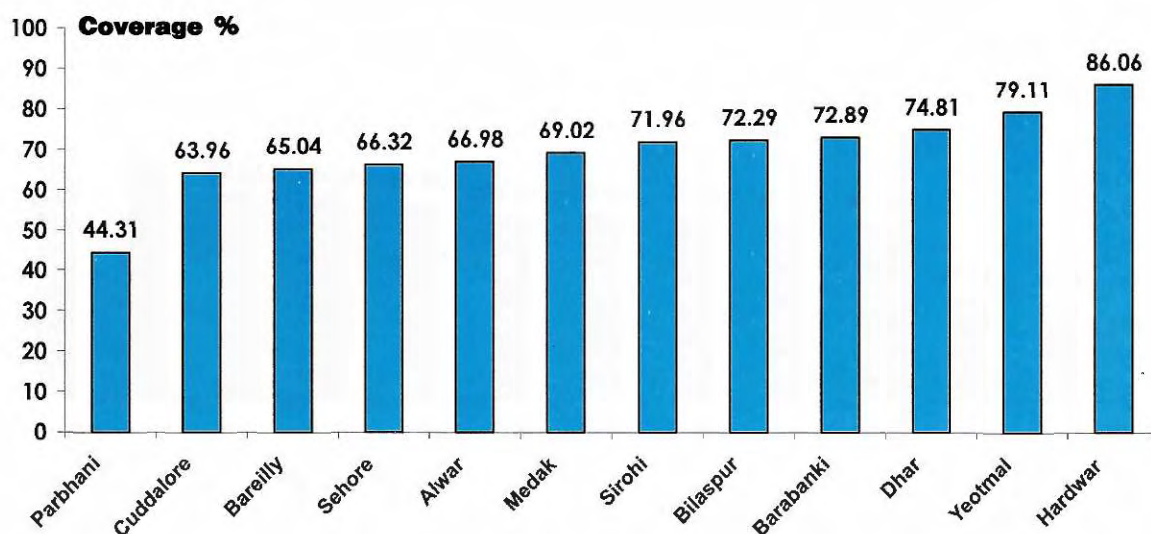


### Age Specific Prevalence of Social Blindness in 50+



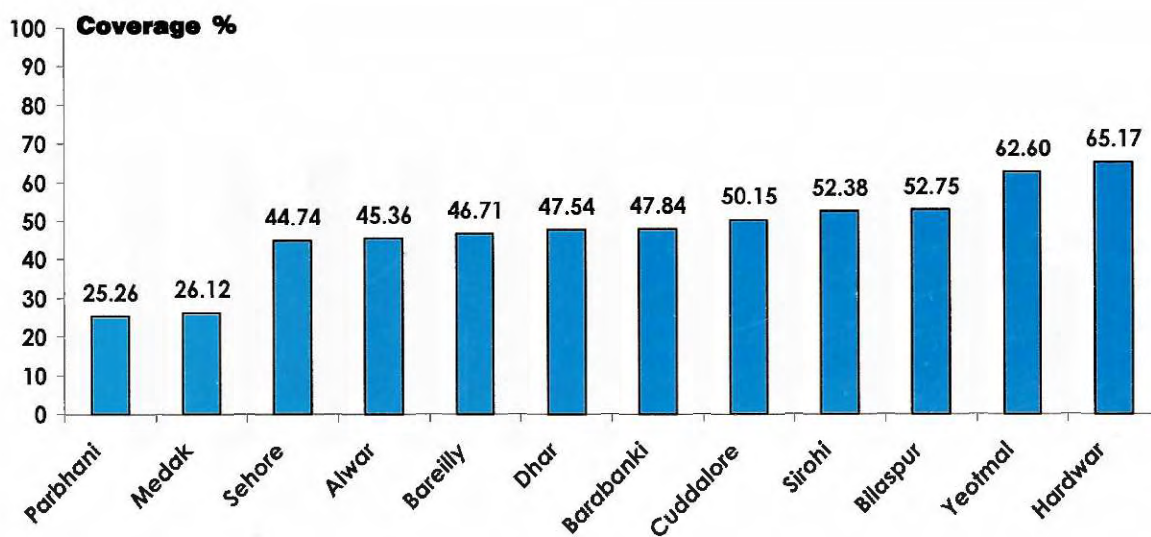
**Table 10: Surgical Coverage (Persons) of Cataract Blindness**

S.No.	District	Persons Operated For Cataract	Unoperated Persons with Cataract & VA < 3/60	Total Operated & Unoperated Cataract Cases	Surgical Coverage %
1	Medak	205	92	297	<b>69.02</b>
2	Dhar	101	34	135	<b>74.81</b>
3	Sehore	128	65	193	<b>66.32</b>
4	Bilaspur	167	64	231	<b>72.29</b>
5	Yeotmal	178	47	225	<b>79.11</b>
6	Parbhani	74	93	167	<b>44.31</b>
7	Alwar	213	105	318	<b>66.98</b>
8	Sirohi	154	60	214	<b>71.96</b>
9	Cuddalore	355	200	555	<b>63.96</b>
10	Bareilly	160	86	246	<b>65.04</b>
11	Barabanki	199	74	273	<b>72.89</b>
12	Hardwar	284	46	330	<b>86.06</b>
		<b>2218</b>	<b>966</b>	<b>3184</b>	<b>69.66</b>



**Table 11: Surgical Coverage (Eyes) of Cataract Blindness**

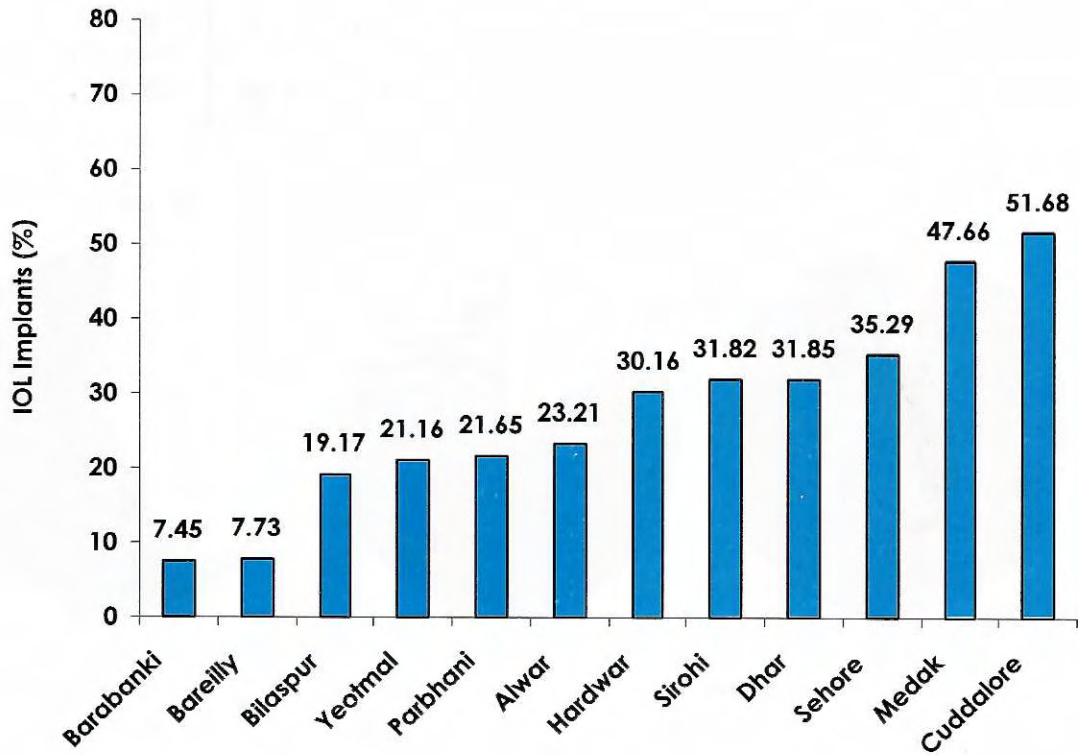
S.No.	District	Eyes Operated For Cataract	Unoperated Eyes with Cataract & VA < 3/60	Total Operated & Unoperated Cataract Cases	Surgical Coverage %
1	Medak	122	345	467	26.12
2	Dhar	135	149	284	47.54
3	Sehore	170	210	380	44.74
4	Bilaspur	240	215	455	52.75
5	Yeotmal	241	144	385	62.60
6	Parbhani	97	287	384	25.26
7	Alwar	293	353	646	45.36
8	Sirohi	220	200	420	52.38
9	Cuddalore	505	502	1007	50.15
10	Bareilly	220	251	471	46.71
11	Barabanki	255	278	533	47.84
12	Hardwar	378	202	580	65.17
		<b>2876</b>	<b>3136</b>	<b>6012</b>	<b>47.84</b>





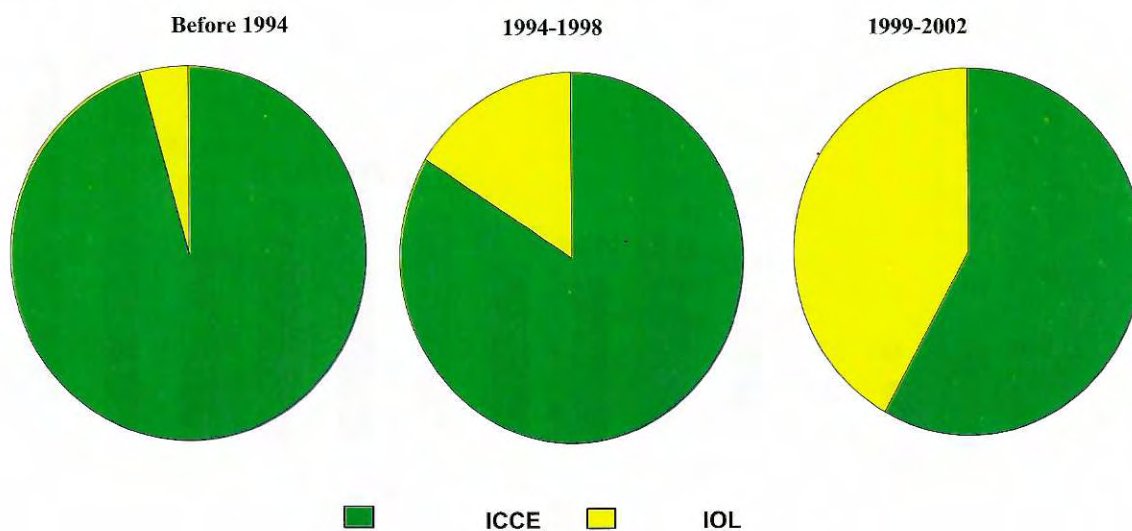
**Table 12: Distribution of Operated Cases by Type of Surgery**

S.No.	District	No. of Cataract Operations Performed	IOL Implants	
			No.	%
1	Medak	256	122	47.66
2	Dhar	135	43	31.85
3	Sehore	170	60	35.29
4	Bilaspur	240	46	19.17
5	Yeotmal	241	51	21.16
6	Parbhani	97	21	21.65
7	Alwar	293	68	23.21
8	Sirohi	220	70	31.82
9	Cuddalore	505	261	51.68
10	Bareilly	220	17	7.73
11	Barabanki	255	19	7.45
12	Hardwar	378	114	30.16
<b>Total</b>		<b>3010</b>	<b>892</b>	<b>29.63</b>



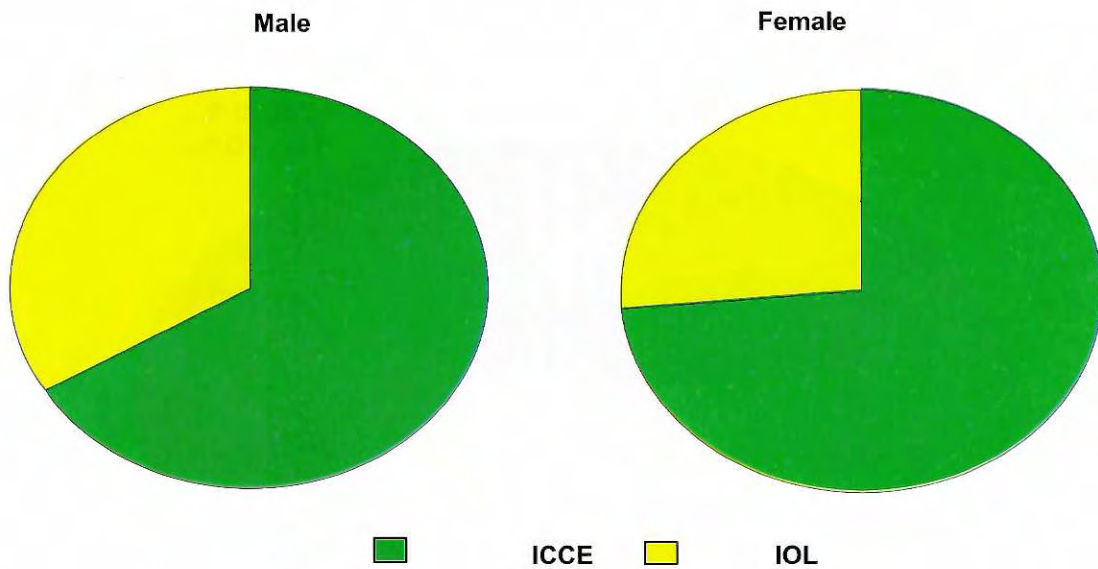
**Table 13: Distribution of Operated Cases by Year of Surgery**

S.No.	District	Before 1994		1994-1998		1999-2002	
		ICCE	IOL	ICCE	IOL	ICCE	IOL
1	Medak	38	2	42	20	44	91
2	Dhar	22	0	15	3	55	40
3	Sehore	11	0	41	12	57	42
4	Bilaspur	32	2	59	4	99	38
5	Yeotmal	28	3	64	7	96	41
6	Parbhani	11	0	22	0	43	21
7	Alwar	61	3	61	12	99	50
8	Sirohi	33	4	37	17	64	42
9	Cuddalore	46	2	73	27	119	231
10	Bareilly	36	1	64	4	87	12
11	Barabanki	40	0	63	4	117	13
12	Hardwar	64	2	71	7	119	104
<b>Total</b>		<b>422</b>	<b>19</b>	<b>612</b>	<b>117</b>	<b>999</b>	<b>725</b>
<b>%</b>		<b>95.68</b>	<b>4.31</b>	<b>83.94</b>	<b>16.05</b>	<b>57.94</b>	<b>42.05</b>



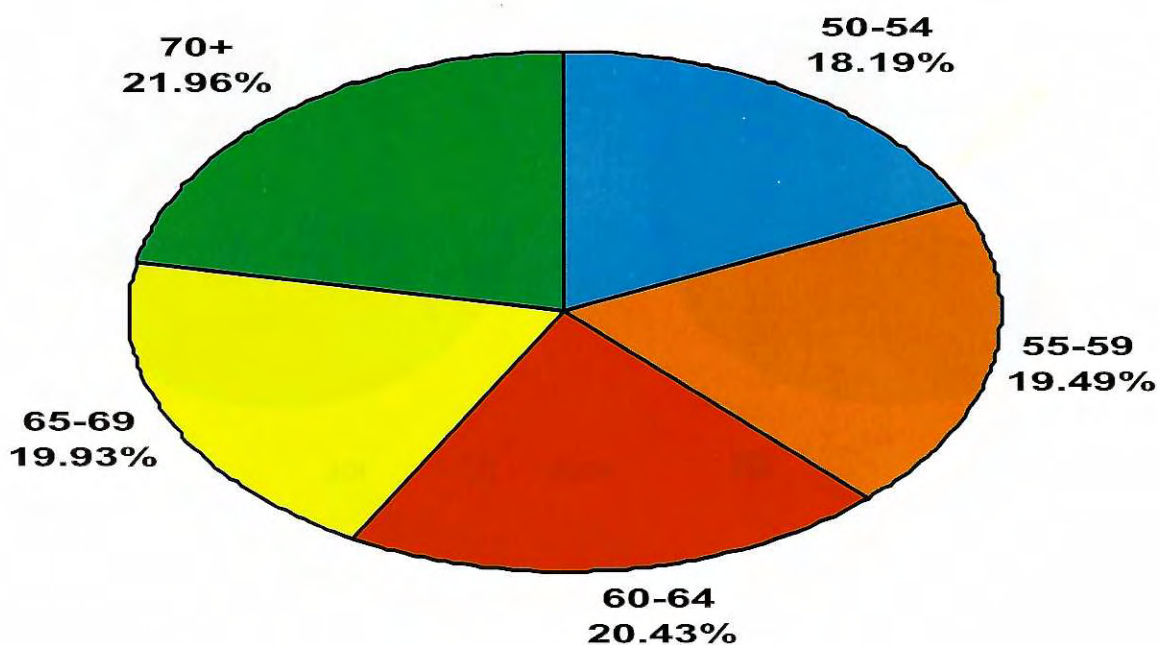
**Table 14: Gender-wise Distribution of Operated Cases in 50+**

S.No.	District	Male			Female		
		ICCE	IOL	Total	ICCE	IOL	Total
1	Medak	38	54	<b>92</b>	96	63	<b>159</b>
2	Dhar	30	14	<b>44</b>	62	29	<b>91</b>
3	Sehore	46	24	<b>70</b>	64	36	<b>100</b>
4	Bilaspur	89	22	<b>111</b>	105	24	<b>129</b>
5	Yeotmal	72	22	<b>94</b>	118	29	<b>147</b>
6	Parbhani	35	14	<b>49</b>	41	7	<b>48</b>
7	Alwar	82	27	<b>109</b>	143	41	<b>184</b>
8	Sirohi	49	33	<b>82</b>	101	37	<b>138</b>
9	Cuddalore	107	139	<b>246</b>	137	122	<b>259</b>
10	Bareilly	93	6	<b>99</b>	110	11	<b>121</b>
11	Barabanki	103	12	<b>115</b>	133	7	<b>140</b>
12	Hardwar	114	68	<b>182</b>	150	46	<b>196</b>
<b>Total</b>		<b>858</b>	<b>435</b>	<b>1293</b>	<b>1260</b>	<b>452</b>	<b>1712</b>
<b>%</b>		<b>66.36</b>	<b>33.64</b>	<b>43.03</b>	<b>73.60</b>	<b>26.40</b>	<b>56.97</b>



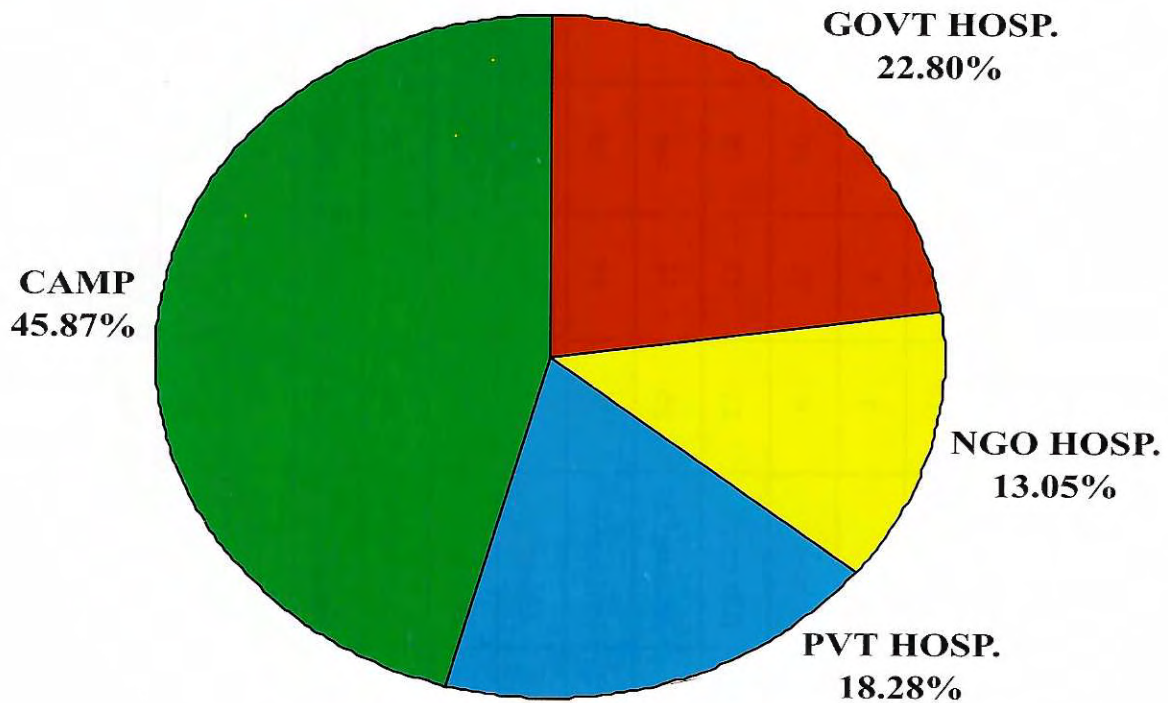
**Table 15: Distribution of Operated Cases by Age at Surgery**

S.No.	District	Age in years					Total
		50-54	55-59	60-64	65-69	70+	
1	Medak	61	58	40	48	48	255
2	Dhar	17	35	35	27	20	134
3	Sehore	20	24	33	34	56	167
4	Bilaspur	45	55	60	45	34	239
5	Yeotmal	34	41	52	59	55	241
6	Parbhani	14	23	20	24	16	97
7	Alwar	44	50	61	55	83	293
8	Sirohi	28	33	43	58	57	219
9	Cuddalore	136	132	91	77	69	505
10	Bareilly	43	32	40	36	70	221
11	Barabanki	41	44	56	58	54	253
12	Hardwar	63	58	82	77	97	377
<b>Total</b>		<b>546</b>	<b>585</b>	<b>613</b>	<b>598</b>	<b>659</b>	<b>3001</b>
<b>%</b>		<b>18.19</b>	<b>19.49</b>	<b>20.43</b>	<b>19.93</b>	<b>21.96</b>	



**Table 16: Distribution of Operated Cases by Place of Surgery**

S.No.	District	Camps		Govt. Hosp.		Vol. Hosp.		Pvt. Hosp.		Total
		No.	%	No.	%	No.	%	No.	%	
1	Medak	36	14.17	130	51.18	44	17.32	44	17.32	254
2	Dhar	79	60.31	22	16.79	14	10.69	16	12.21	131
3	Sehore	53	33.33	56	35.22	33	20.75	17	10.69	159
4	Bilaspur	164	69.79	28	11.91	16	6.81	27	11.49	235
5	Yeotmal	178	74.48	37	15.48	0	0.00	24	10.04	239
6	Parbhani	41	42.27	45	46.39	10	10.31	1	1.03	97
7	Alwar	174	60.84	39	13.64	4	1.40	69	24.13	286
8	Sirohi	119	55.87	18	8.45	6	2.82	70	32.86	213
9	Cuddalore	154	30.86	191	38.28	97	19.44	57	11.42	499
10	Bareilly	99	45.83	27	12.50	57	26.39	33	15.28	216
11	Barabanki	99	40.08	61	24.70	39	15.79	48	19.43	247
12	Hardwar	154	41.96	17	4.63	64	17.44	132	35.97	367
<b>Total</b>		<b>1350</b>	<b>45.87</b>	<b>671</b>	<b>22.80</b>	<b>384</b>	<b>13.05</b>	<b>538</b>	<b>18.28</b>	<b>2943</b>

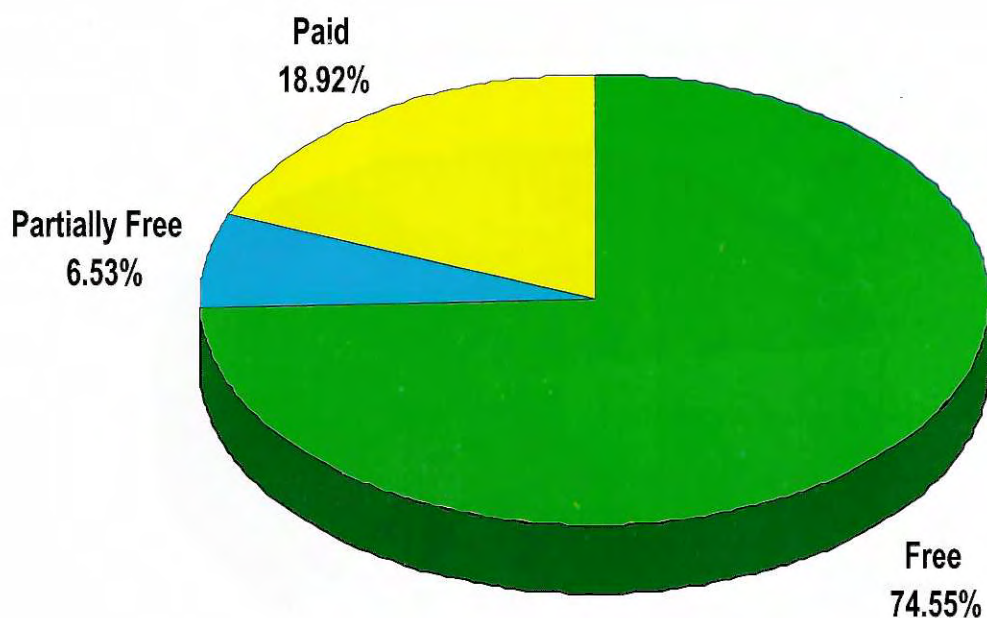


**Table 17: Place of Cataract Surgery by Year**

S.No.	District	Camps			Govt. Hosp.			Vol. Hosp.			Pvt. Hosp.		
		<1994	1994-1998	1999-2002	<1994	1994-1998	1999-2002	<1994	1994-1998	1999-2002	<1994	1994-1998	1999-2002
1	Medak	1	2	22	28	31	69	4	18	22	7	12	22
2	Dhar	8	5	64	7	8	7	4	4	6	3	1	12
3	Sehore	8	32	50	0	11	24	0	2	12	3	8	13
4	Bilaspur	21	43	99	5	5	28	1	8	7	7	7	13
5	Yeotmal	25	54	98	6	10	21	0	0	0	0	6	18
6	Parbhani	7	18	50	2	4	14	2	0	0	0	0	0
7	Alwar	35	43	95	16	8	15	0	1	3	13	21	36
8	Sirohi	22	28	65	2	5	10	0	1	5	13	21	24
9	Cuddalore	26	61	186	9	24	92	7	10	68	6	5	6
10	Bareilly	15	23	56	11	7	11	10	29	24	5	15	15
11	Barabanki	9	26	59	8	16	34	13	9	17	10	16	20
12	Hardwar	22	40	92	2	4	10	2	15	47	40	19	73
<b>Total</b>		<b>199</b>	<b>375</b>	<b>936</b>	<b>96</b>	<b>133</b>	<b>335</b>	<b>43</b>	<b>97</b>	<b>211</b>	<b>107</b>	<b>131</b>	<b>252</b>
<b>%</b>		<b>44.72</b>	<b>50.95</b>	<b>53.98</b>	<b>21.57</b>	<b>18.07</b>	<b>19.32</b>	<b>9.66</b>	<b>13.18</b>	<b>12.17</b>	<b>24.04</b>	<b>17.80</b>	<b>14.53</b>

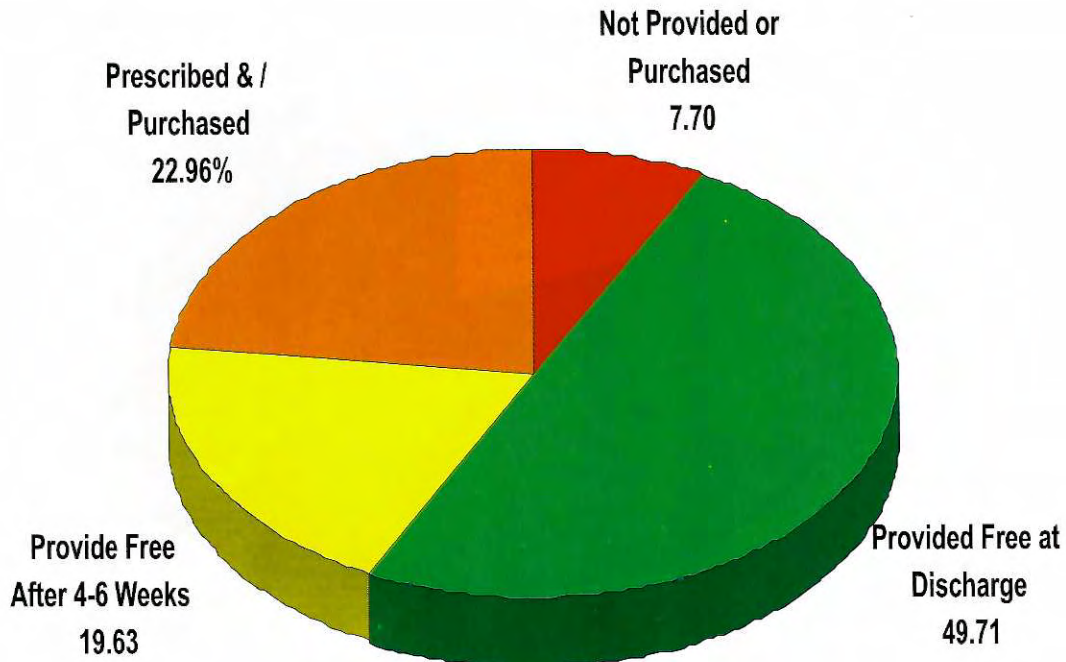
**Table 18: Distribution of Operated Cases by Payment For Services**

S.No.	District	Free	Partially Free	Paid	Total	% Free
1	Medak	204	0	42	246	82.93
2	Dhar	99	14	19	132	75.00
3	Sehore	133	9	28	170	78.24
4	Bilaspur	196	9	30	235	83.40
5	Yeotmal	216	4	24	244	88.52
6	Parbhani	91	2	4	97	93.81
7	Alwar	191	23	73	287	66.55
8	Sirohi	136	6	71	213	63.85
9	Cuddalore	432	27	42	501	86.23
10	Bareilly	120	77	37	234	51.28
11	Barabanki	179	10	58	247	72.47
12	Hardwar	217	13	134	364	59.62
<b>Total</b>		<b>2214</b>	<b>194</b>	<b>562</b>	<b>2970</b>	<b>74.55</b>
<b>%</b>		<b>74.55</b>	<b>6.53</b>	<b>18.92</b>	<b>100.00</b>	



**Table 19: Distribution of ICCE Cases by Provision of Spectacles**

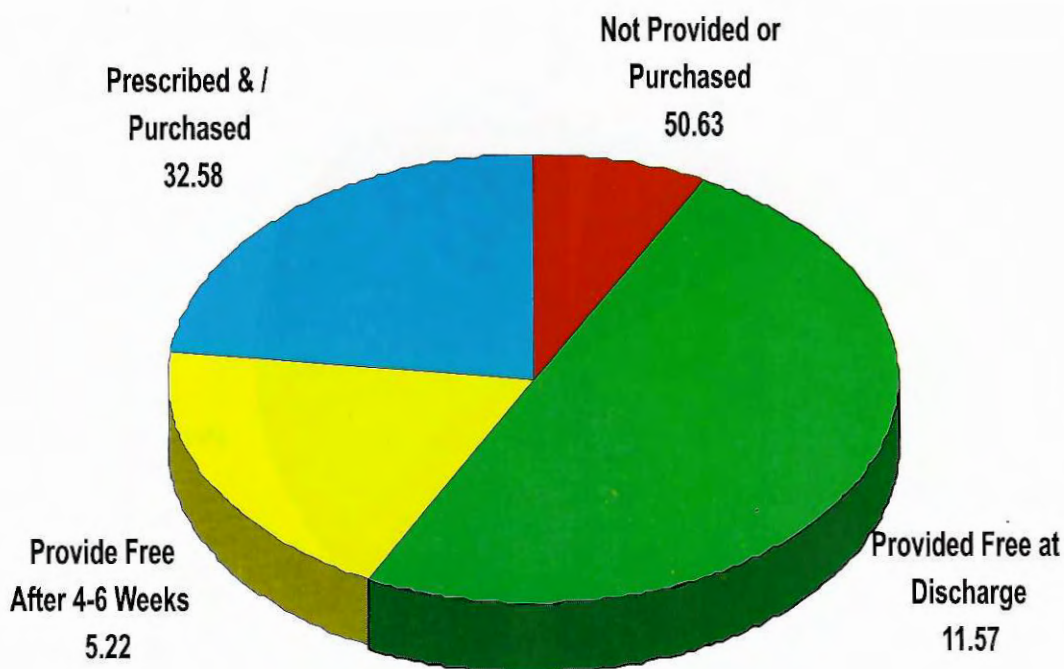
S.No.	District	Not Provided or Purchased	Provided Free at Discharge	Provided Free after 4-6 weeks	Prescribed &/or Purchased	Total
1	Medak	12	22	16	73	123
2	Dhar	9	46	19	12	86
3	Sehore	20	27	32	31	110
4	Bilaspur	12	100	62	17	191
5	Yeotmal	16	73	77	4	170
6	Parbhani	3	0	71	2	76
7	Alwar	7	119	42	55	223
8	Sirohi	5	104	0	35	144
9	Cuddalore	28	158	14	42	242
10	Bareilly	20	102	2	76	200
11	Barabanki	10	113	50	55	228
12	Hardwar	15	149	15	66	245
<b>Total</b>		<b>157</b>	<b>1013</b>	<b>400</b>	<b>468</b>	<b>2038</b>
<b>%</b>		<b>7.70</b>	<b>49.71</b>	<b>19.63</b>	<b>22.96</b>	<b>100.00</b>





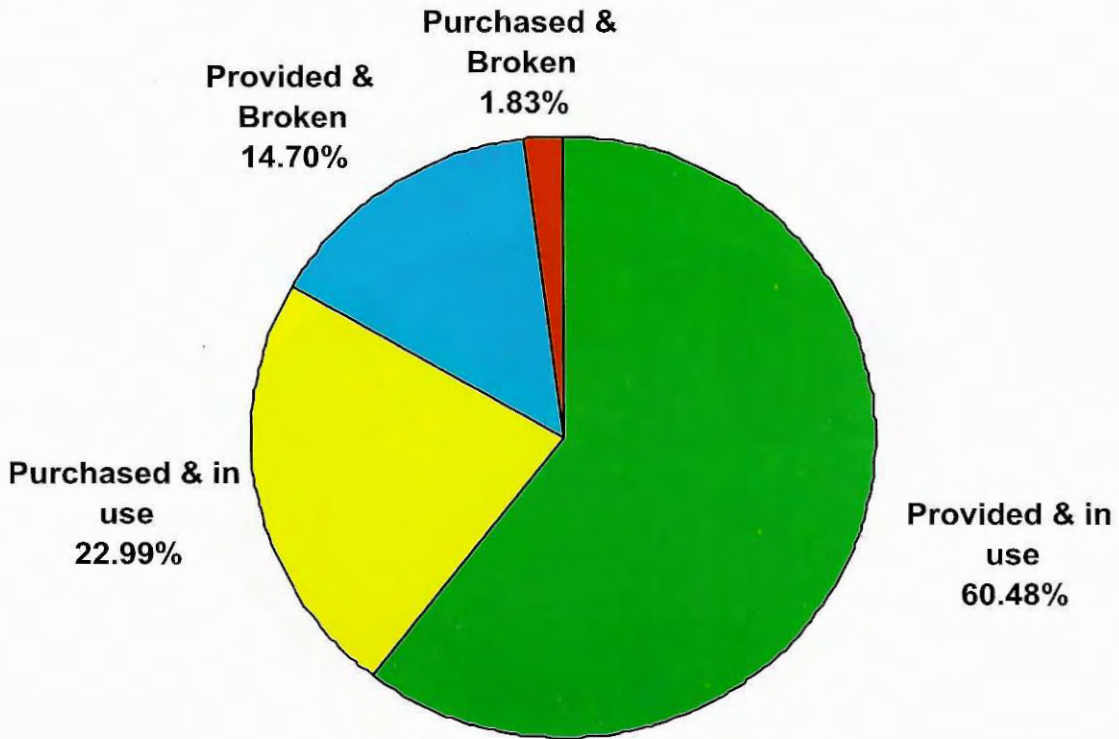
**Table 20: Distribution of IOL Cases by Provision of Spectacles**

S.No.	District	Not Provided or Purchased	Provided Free at Discharge	Provided Free after 4-6 weeks	Prescribed &/or Purchased	Total
1	Medak	45	5	1	62	113
2	Dhar	9	7	1	3	20
3	Sehore	33	2	2	23	60
4	Bilaspur	30	0	0	17	47
5	Yeotmal	4	14	11	18	47
6	Parbhani	2	1	1	0	4
7	Alwar	44	9	1	6	60
8	Sirohi	8	30	1	27	66
9	Cuddalore	157	12	19	32	220
10	Bareilly	10	0	0	7	17
11	Barabanki	4	0	0	13	17
12	Hardwar	13	2	0	23	38
<b>Total</b>		<b>359</b>	<b>82</b>	<b>37</b>	<b>231</b>	<b>709</b>
<b>%</b>		<b>50.63</b>	<b>11.57</b>	<b>5.22</b>	<b>32.58</b>	<b>100.00</b>



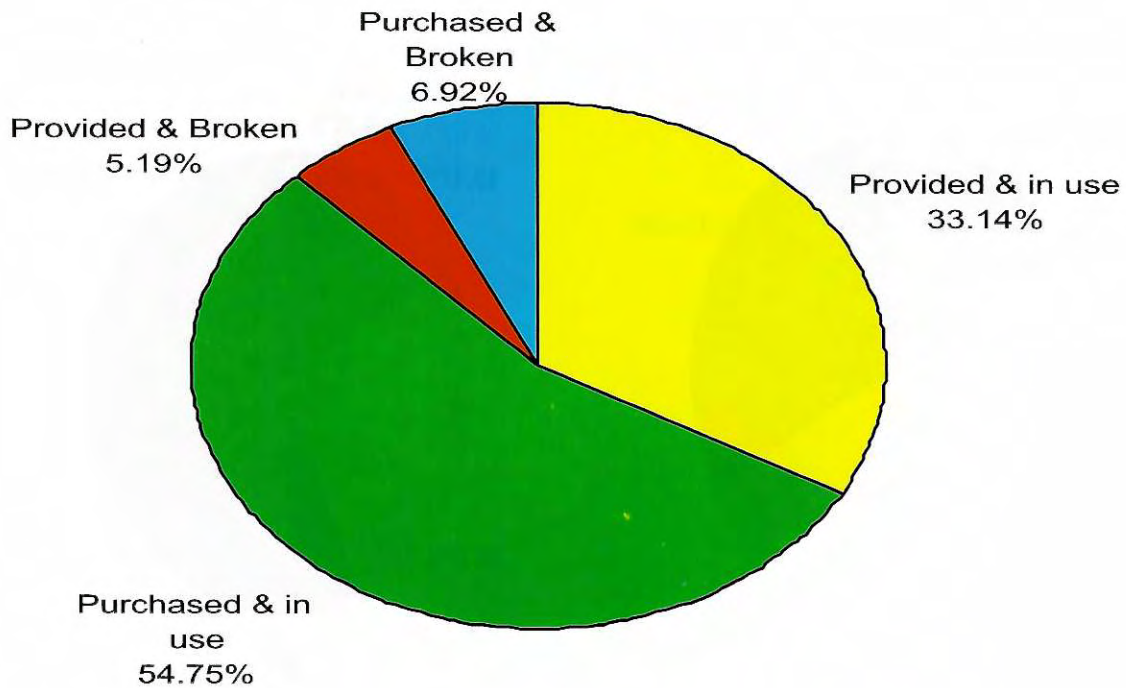
**Table 21: Distribution of ICCE Cases by Status of Spectacles**

S.No.	District	Provided & in Use	Purchased & in Use	Provided & Broken	Purchased & Broken	Total
1	Medak	30	73	3	4	110
2	Dhar	56	14	11	1	82
3	Sehore	47	25	9	5	86
4	Bilaspur	130	24	88	0	242
5	Yeotmal	139	33	10	0	182
6	Parbhani	42	6	24	1	73
7	Alwar	138	29	26	7	200
8	Sirohi	91	31	16	4	142
9	Cuddalore	113	45	40	6	204
10	Bareilly	123	34	25	3	185
11	Barabanki	112	84	19	3	218
12	Hardwar	168	54	18	2	242
<b>Total</b>		<b>1189</b>	<b>452</b>	<b>289</b>	<b>36</b>	<b>1966</b>
<b>%</b>		<b>60.48</b>	<b>22.99</b>	<b>14.70</b>	<b>1.83</b>	<b>100.00</b>



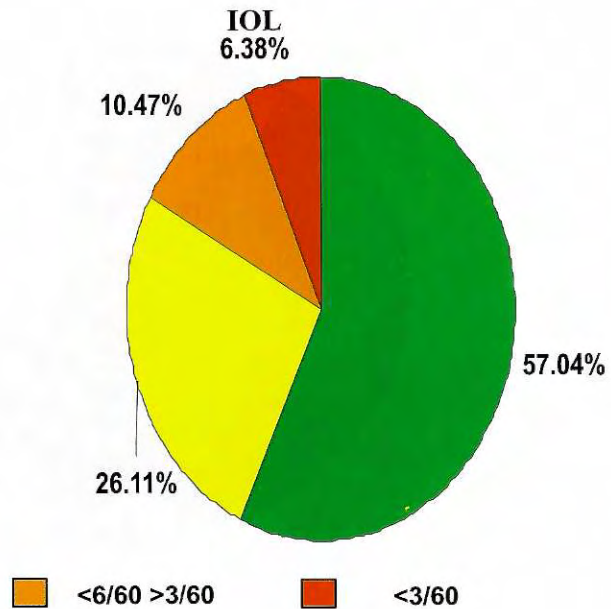
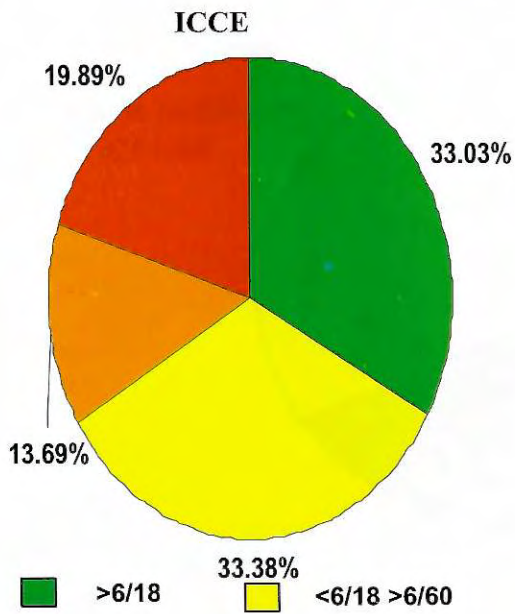
**Table 22: Distribution of IOL Cases by Status of Spectacles**

S.No.	District	Provided & in Use	Purchased & in Use	Provided & Broken	Purchased & Broken	Total
1	Medak	4	57	2	4	67
2	Dhar	10	2	0	0	12
3	Sehore	2	21	3	3	29
4	Bilaspur	3	12	0	2	17
5	Yeotmal	26	21	0	0	47
6	Parbhani	0	0	0	0	0
7	Alwar	6	5	3	1	15
8	Sirohi	28	24	7	3	62
9	Cuddalore	31	31	3	4	69
10	Bareilly	3	0	0	4	7
11	Barabanki	0	10	0	2	12
12	Hardwar	2	7	0	1	10
<b>Total</b>		<b>115</b>	<b>190</b>	<b>18</b>	<b>24</b>	<b>347</b>
<b>%</b>		<b>33.14</b>	<b>54.76</b>	<b>5.19</b>	<b>6.92</b>	<b>100.00</b>



**Table 23: Visual Acuity of Operated Cases by Type of Surgery**

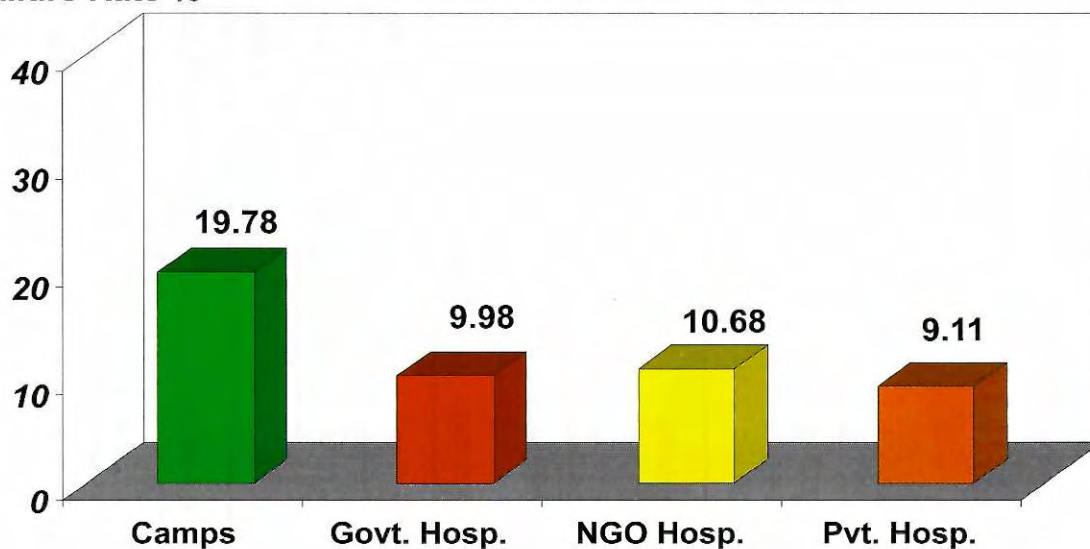
S. No.	District	Number of Operated Cases With Post-Operative VA								Total	
		>6/18		<6/18 >6/60		<6/60 >3/60		<3/60			
		ICCE	IOL	ICCE	IOL	ICCE	IOL	ICCE	IOL	ICCE	IOL
1	Medak	50	38	52	36	15	41	28	20	145	135
2	Dhar	19	18	26	11	17	5	13	1	75	35
3	Sehore	29	26	28	16	24	10	29	8	110	60
4	Bilaspur	45	24	65	16	42	1	42	5	194	46
5	Yeotmal	24	21	112	23	22	4	31	3	189	51
6	Parbhani	44	17	4	2	8	0	17	2	73	21
7	Alwar	82	51	54	12	33	3	56	2	225	68
8	Sirohi	89	65	30	1	3	2	12	2	134	70
9	Cuddalore	41	137	79	45	26	13	26	5	172	200
10	Bareilly	57	13	61	4	24	0	59	0	201	17
11	Barabanki	100	11	71	8	13	0	49	0	233	19
12	Hardwar	76	53	81	43	45	8	33	5	235	109
	<b>Total</b>	<b>656</b>	<b>474</b>	<b>663</b>	<b>217</b>	<b>272</b>	<b>87</b>	<b>395</b>	<b>53</b>	<b>1986</b>	<b>831</b>
	<b>%</b>	<b>33.03</b>	<b>57.03</b>	<b>33.38</b>	<b>26.11</b>	<b>13.69</b>	<b>10.47</b>	<b>19.89</b>	<b>6.38</b>		



**Table 24: Visual Acuity of Operated Cases by Place of Surgery**

S.No.	District	Number of Cases With VA < 3/60 Operated at				Total
		Camps	Government Hospitals	NGO Hospitals	Pvt. Hospitals	
1	Medak	10	20	5	8	43
2	Dhar	11	3	0	0	14
3	Sehore	26	6	3	2	37
4	Bilaspur	31	5	3	4	43
5	Yeotmal	31	0	0	2	33
6	Parbhani	18	1	0	0	19
7	Alwar	40	8	0	7	55
8	Sirohi	7	2	0	3	12
9	Cuddalore	22	5	3	1	31
10	Bareilly	28	11	13	6	58
11	Barabanki	25	5	8	6	44
12	Hardwar	18	1	6	10	35
<b>Total</b>		<b>267</b>	<b>67</b>	<b>41</b>	<b>49</b>	<b>424</b>
<b>Patients Operated</b>		<b>1350</b>	<b>671</b>	<b>384</b>	<b>538</b>	<b>2943</b>
<b>% Failure Rate</b>		<b>19.78</b>	<b>9.98</b>	<b>10.68</b>	<b>9.11</b>	<b>14.41</b>

**Failure Rate %**



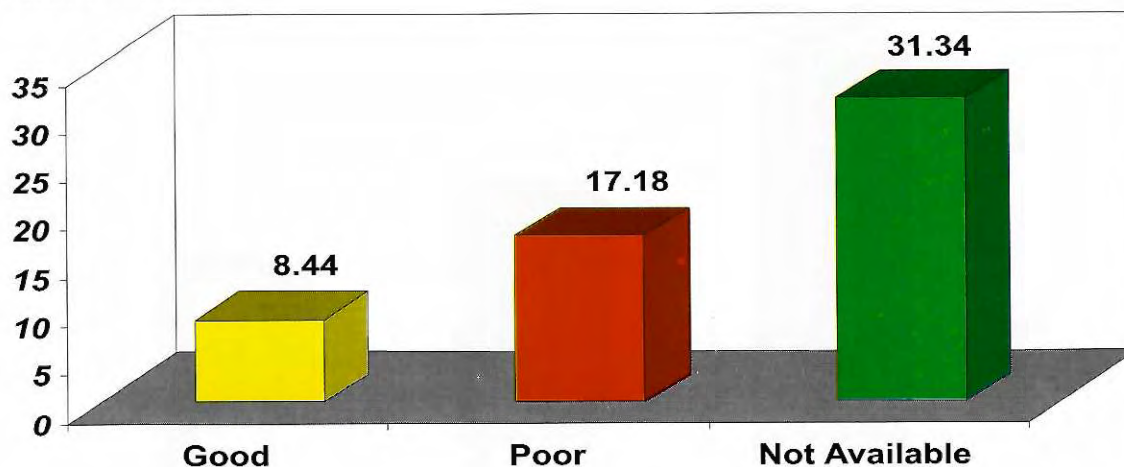
**Table 25: Visual Acuity of Operated Cases by Status of Spectacles**

S. No.	District	Status of Spectacles											
		Provided & in Use			Purchased & in Use			Provided & Broken			Purchased & Broken		
		No.	No. with VA < 3/60	%	No.	No. with VA < 3/60	%	No.	No. with VA < 3/60	%	No.	No. with VA < 3/60	%
1	Medak	34	7	20.59	130	13	10.00	5	2	40.00	8	3	37.50
2	Dhar	66	6	9.09	16	1	6.25	11	4	36.36	1	1	100.00
3	Sehore	49	8	16.33	46	7	15.22	12	3	25.00	8	4	50.00
4	Bilaspur	133	23	17.29	36	5	13.89	28	9	32.14	2	0	0.00
5	Yeotmal	165	22	13.33	54	4	7.41	10	5	50.00	0	0	0.00
6	Parbhani	42	4	9.52	6	2	33.33	24	10	41.67	1	0	0.00
7	Alwar	144	20	13.89	54	8	14.81	29	20	68.97	8	5	62.50
8	Sirohi	120	3	2.50	55	2	3.64	23	6	26.09	7	0	0.00
9	Cuddalore	144	3	2.08	66	3	4.55	43	10	23.26	10	0	0.00
10	Bareilly	134	22	16.42	41	6	14.63	27	19	70.37	7	1	14.29
11	Barabanki	112	14	12.50	94	13	13.83	19	10	52.63	5	0	0.00
12	Hardwar	170	17	10.00	55	6	10.91	18	5	27.78	3	0	0.00
		<b>1313</b>	<b>149</b>	<b>11.35</b>	<b>653</b>	<b>70</b>	<b>10.72</b>	<b>249</b>	<b>103</b>	<b>41.37</b>	<b>60</b>	<b>14</b>	<b>23.33</b>

**Table 26: Visual Acuity of Operated Cases by Condition of Glasses**

S.No.	District	Condition of Glasses					
		Good		Poor		Not Available	
		No.	No. with VA < 3/60	No.	No. with VA < 3/60	No.	No. with VA < 3/60
1	Medak	149	15	10	3	24	11
2	Dhar	59	4	12	3	7	3
3	Sehore	48	2	52	13	37	13
4	Bilaspur	130	18	46	11	54	14
5	Yeotmal	177	17	49	9	6	6
6	Parbhani	34	3	19	3	17	7
7	Alwar	132	18	71	13	50	20
8	Sirohi	139	1	48	6	22	5
9	Cuddalore	132	2	89	6	89	15
10	Bareilly	54	6	108	24	50	15
11	Barabanki	129	14	83	14	17	8
12	Hardwar	191	16	30	1	29	9
<b>Total</b>		<b>1374</b>	<b>116</b>	<b>617</b>	<b>106</b>	<b>402</b>	<b>126</b>
<b>VA &lt; 3/60 %</b>			<b>8.44</b>		<b>17.18</b>		<b>31.34</b>

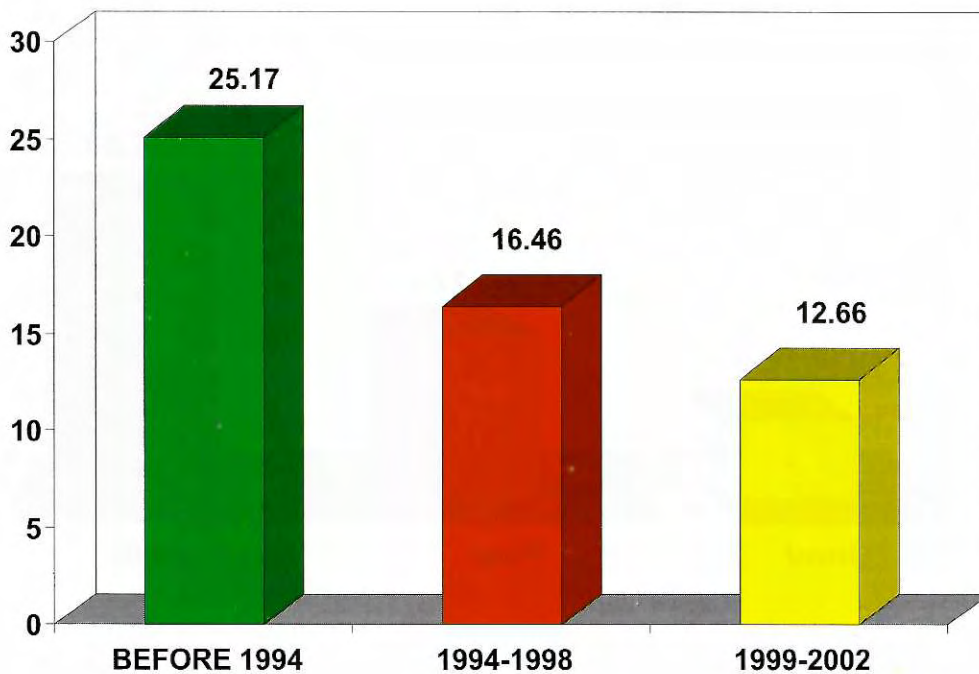
**Failure Rate %**



**Table 27: Visual Acuity of Operated Cases by Year of Surgery**

S.No.	District	Before 1994		1994-1998		1999-2002	
		Total	VA<3/60	Total	VA<3/60	Total	VA<3/60
1	Medak	40	11	62	10	135	27
2	Dhar	22	4	18	2	95	8
3	Sehore	11	6	53	14	99	17
4	Bilaspur	34	12	63	12	137	23
5	Yeotmal	31	6	71	8	137	20
6	Parbhani	11	3	22	7	54	9
7	Alwar	64	17	73	17	149	24
8	Sirohi	37	5	54	4	106	5
9	Cuddalore	48	5	100	10	350	16
10	Bareilly	37	19	68	14	99	26
11	Barabanki	40	13	67	13	130	23
12	Hardwar	66	10	78	9	223	19
<b>Total</b>		<b>441</b>	<b>111</b>	<b>729</b>	<b>120</b>	<b>1714</b>	<b>217</b>
<b>VA &lt;3/60 %</b>			<b>25.17</b>		<b>16.46</b>		<b>12.66</b>

**Failure Rate %**

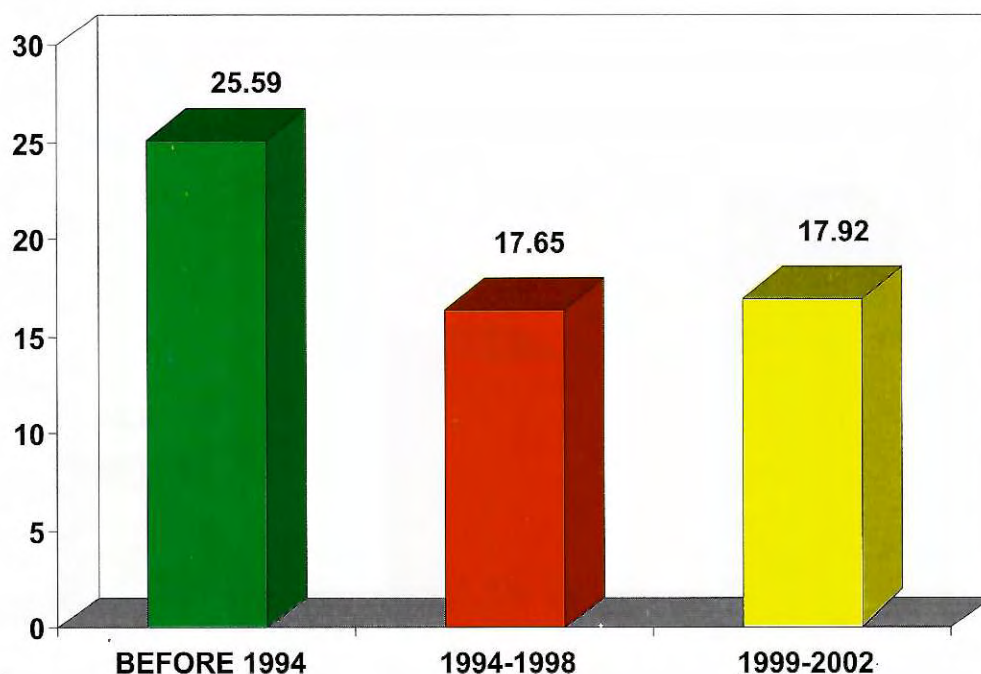




**Table 28: Visual Acuity of ICCE Cases by Year of Surgery**

S.No.	District	Before 1994		1994-1998		1999-2002	
		Total	VA < 3/60	Total	VA < 3/60	Total	VA < 3/60
1	Medak	38	10	42	4	44	14
2	Dhar	22	4	15	2	55	7
3	Sehore	11	6	41	11	57	12
4	Bilaspur	32	11	59	12	99	19
5	Yeotmal	28	5	64	8	96	18
6	Parbhani	11	3	22	7	43	7
7	Alwar	61	17	61	16	99	23
8	Sirohi	33	5	37	3	64	4
9	Cuddalore	46	5	73	9	119	12
10	Bareilly	36	19	64	14	87	26
11	Barabanki	40	13	63	13	117	23
12	Hardwar	64	10	71	9	119	14
<b>Total</b>		<b>422</b>	<b>108</b>	<b>612</b>	<b>108</b>	<b>999</b>	<b>179</b>
<b>VA &lt; 3/60 %</b>			<b>25.59</b>		<b>17.65</b>		<b>17.92</b>

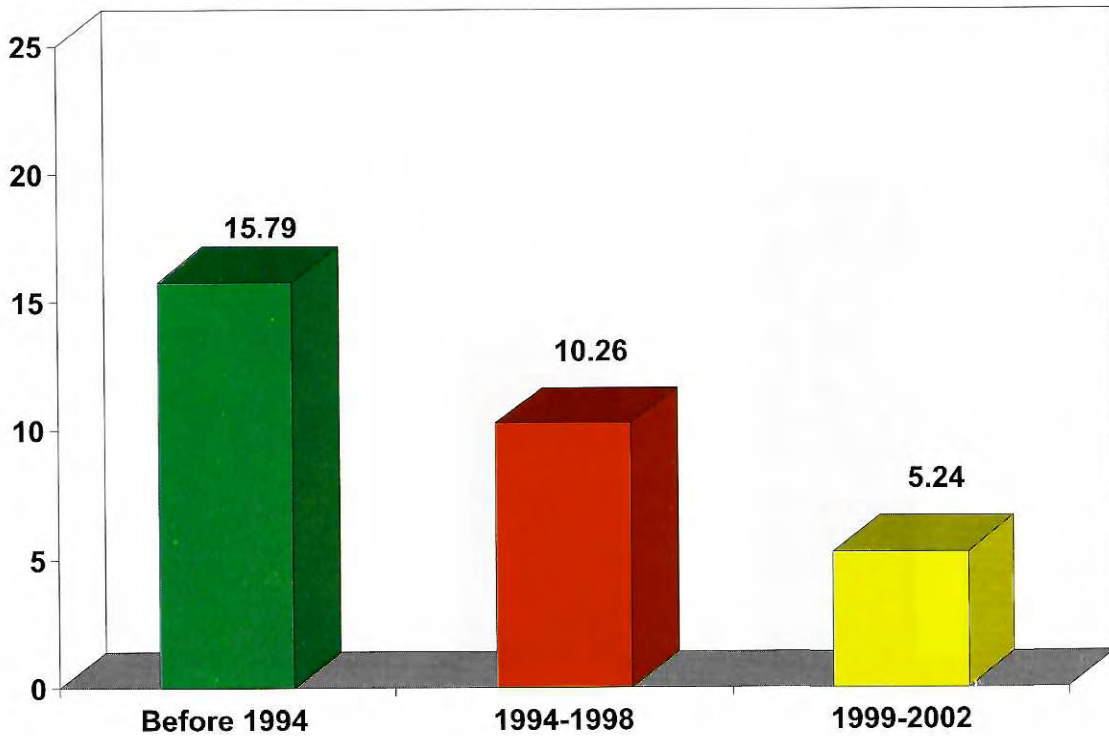
**Failure Rate %**



**Table 29: Visual Acuity of IOL Cases by Year of Surgery**

S.No.	District	Before 1994		1994-1998		1999-2002	
		Total	VA <3/60	Total	VA <3/60	Total	VA <3/60
1	Medak	2	1	20	6	91	13
2	Dhar	0	0	3	0	40	1
3	Sehore	0	0	12	3	42	5
4	Bilaspur	2	1	4	0	38	4
5	Yeotmal	3	1	7	0	41	2
6	Parbhani	0	0	0	0	21	2
7	Alwar	3	0	12	1	50	1
8	Sirohi	4	0	17	1	42	1
9	Cuddalore	2	0	27	1	231	4
10	Bareilly	1	0	4	0	12	0
11	Barabanki	0	0	4	0	13	0
12	Hardwar	2	0	7	0	104	5
<b>Total</b>		<b>19</b>	<b>3</b>	<b>117</b>	<b>12</b>	<b>725</b>	<b>38</b>
<b>VA &lt;3/60 %</b>			<b>15.79</b>		<b>10.26</b>		<b>5.24</b>

**Failure Rate %**



**Table 30: Presenting v/s Best Corrected Visual Acuity of Survey Population (50+)**

	VA	Best Corrected Visual Acuity				
		>6/18	<6/18 >6/60	<6/60 >3/60	<3/60	
Presenting Visual Acuity	>6/18	30878	0	0	0	30878
	<6/18 >6/60	4509	2276	0	0	6785
	<6/60 >3/60	186	1480	743	0	2409
	<3/60	29	107	462	1907	2505
		<b>35602</b>	<b>3863</b>	<b>1205</b>	<b>1907</b>	<b>42577</b>

Prevalence of Social Blindness (Presenting Visual Acuity)	5.88
Prevalence of Social Blindness (Best Corrected Visual Acuity)	4.48
Prevalence of Economic Blindness (Presenting Visual Acuity)	5.66
Prevalence of Economic Blindness (Best Corrected Visual Acuity)	2.83
Prevalence of Low Vision (Presenting Visual Acuity)	15.94
Prevalence of Low Vision (Best Corrected Visual Acuity)	9.07

**Table 31: Visual Outcome Following ICCE  
Presenting v/s Best Corrected VA**

	VA	Best Corrected Visual Acuity				
		>6/18	<6/18 >6/60	<6/60 >3/60	<3/60	
<b>Presenting Visual Acuity</b>	>6/18	429	0	0	0	<b>429</b>
	<6/18 >6/60	89	165	0	0	<b>254</b>
	<6/60 >3/60	23	99	50	0	<b>172</b>
	<3/60	13	43	49	176	<b>281</b>
		<b>554</b>	<b>307</b>	<b>99</b>	<b>176</b>	<b>1136</b>

% Operated cases with Visual Acuity <3/60 (Presenting)	<b>24.74</b>
% Operated cases with Visual Acuity <3/60 (Best Corrected)	<b>15.49</b>
% Operated cases with Visual Acuity <6/60 (Presenting)	<b>15.14</b>
% Operated cases with Visual Acuity <6/60 (Best Corrected)	<b>8.71</b>

**Table 32: Visual Outcome Following ECCE/IOL  
Presenting v/s Best Corrected VA**

	VA	Best Corrected Visual Acuity				
		>6/18	<6/18 >6/60	<6/60 >3/60	<3/60	
<b>Presenting Visual Acuity</b>	>6/18	217	0	0	0	<b>217</b>
	<6/18 >6/60	78	23	0	0	<b>101</b>
	<6/60 >3/60	3	18	8	0	<b>29</b>
	<3/60	0	1	9	21	<b>31</b>
		<b>298</b>	<b>42</b>	<b>17</b>	<b>21</b>	<b>378</b>

% Operated cases with Visual Acuity <3/60 (Presenting) **8.20**

% Operated cases with Visual Acuity <3/60 (Best Corrected) **5.56**

% Operated cases with Visual Acuity <6/60 (Presenting) **7.67**

% Operated cases with Visual Acuity <6/60 (Best Corrected) **4.50**

**Table 32: Visual Outcome Following ECCE/IOL  
Presenting v/s Best Corrected VA**

	VA	Best Corrected Visual Acuity				
		>6/18	<6/18 >6/60	<6/60 >3/60	<3/60	
<b>Presenting Visual Acuity</b>	>6/18	217	0	0	0	<b>217</b>
	<6/18 >6/60	78	23	0	0	<b>101</b>
	<6/60 >3/60	3	18	8	0	<b>29</b>
	<3/60	0	1	9	21	<b>31</b>
		<b>298</b>	<b>42</b>	<b>17</b>	<b>21</b>	<b>378</b>

% Operated cases with Visual Acuity <3/60 (Presenting) **8.20**

% Operated cases with Visual Acuity <3/60 (Best Corrected) **5.56**

% Operated cases with Visual Acuity <6/60 (Presenting) **7.67**

% Operated cases with Visual Acuity <6/60 (Best Corrected) **4.50**

**RAPID ASSESSMENT OF BLINDNESS**

**A. General Information**

Custer

Name \_\_\_\_\_ Household No

Sex Male  1 Age  Individual No

Female  2

Current Occupation Works & earns income  1 Works but earns no Income  3

Only household work  2 No work at all  4

Examination Status Available  1 ..... Go to B

Not available  2 ..... Go to C

Refused  3 ..... Go to C

**B. Examination**

Vission (with available glasses, if any)

Lens Examination

	Right Eye	PHR	Left Eye	PHL				
Can see 6/18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	Normal	<input type="checkbox"/>	1
Cannot see 6/18, but can see 6/60	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	Obvious opacity present	<input type="checkbox"/>	2
Cannot see 6/60, but can see 3/60	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	Absent (aphakia)	<input type="checkbox"/>	3 ..... (Go to D)
Cannot see 3/60	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	Pseudophakia (IOL)	<input type="checkbox"/>	4 ..... (Go to D)

**C. History of persons not examined**

	Right Eye	Left Eye	
Believed not blind due to cataract	<input type="checkbox"/>	<input type="checkbox"/>	1
Believed blind due to cataract	<input type="checkbox"/>	<input type="checkbox"/>	2
Believe operated for cataract	<input type="checkbox"/>	<input type="checkbox"/>	3
Believed not blind	<input type="checkbox"/>	<input type="checkbox"/>	4

**D. Details about Cataract Operation**

	Right Eye	Left Eye		Right Eye	Left Eye
<u>Years since operation</u>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<u>Status of spectacles</u>		
<u>Place of Operation</u>			Provided and in use	<input type="checkbox"/> 1	<input type="checkbox"/> 1
Eye Camp	<input type="checkbox"/> 1	<input type="checkbox"/> 1	Provided and broken	<input type="checkbox"/> 2	<input type="checkbox"/> 2
Government hospital	<input type="checkbox"/> 2	<input type="checkbox"/> 2	Purchased and in use	<input type="checkbox"/> 3	<input type="checkbox"/> 3
Voluntary/Charitable hospital	<input type="checkbox"/> 3	<input type="checkbox"/> 3	Purchased and broken	<input type="checkbox"/> 4	<input type="checkbox"/> 4
Private hospital	<input type="checkbox"/> 4	<input type="checkbox"/> 4	<u>Condition of glasses</u>		
<u>Provision of services</u>			Good	<input type="checkbox"/> 1	<input type="checkbox"/> 1
Totally free	<input type="checkbox"/> 1	<input type="checkbox"/> 1	Poor	<input type="checkbox"/> 2	<input type="checkbox"/> 2
Partially free	<input type="checkbox"/> 2	<input type="checkbox"/> 2	Not available	<input type="checkbox"/> 3	<input type="checkbox"/> 3
Paid	<input type="checkbox"/> 3	<input type="checkbox"/> 3	<u>Type of surgery</u>		
<u>Provision of spectacles</u>			Conventional	<input type="checkbox"/> 1	<input type="checkbox"/> 1
Not provided or purchased	<input type="checkbox"/> 1	<input type="checkbox"/> 1	IOL implant	<input type="checkbox"/> 2	<input type="checkbox"/> 2
Provided free at discharge	<input type="checkbox"/> 2	<input type="checkbox"/> 2			
Provided free after 4-6 weeks	<input type="checkbox"/> 3	<input type="checkbox"/> 3			
Prescribed and/or purchased	<input type="checkbox"/> 4	<input type="checkbox"/> 4			

## INSTRUCTIONS FOR THE SURVEY TEAMS

### **A. Responsibilities of the Chief Surveyors (Ophthalmologist & Epidemiologist)**

1. 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.
2. Training of the Field Supervisor & Ophthalmic Assistants (OA) on procedure for carrying out the survey.
3. Field training of the survey team on selection of the first household in the cluster to be surveyed; filling up proforma by the OA and cross-checking at least 3 randomly selected eligible persons to compare with the findings recorded by the OA to ensure quality of data.
4. Supervision of the survey work in the selected clusters.
5. Making sure that all the 20 selected 'clusters' in each district have been surveyed and dispatching all the 20 survey books to ADG(O), New Delhi 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.

### **B. Responsibilities of the District Coordination Team (CMO, DOS, DPM)**

1. Organizing selection of Field Supervisor, OAs and Health Workers and their deputation for the survey.
2. Preparing day-wise schedule for carrying out the survey in the selected clusters and arranging the vehicles for the survey teams.
3. Organizing logistics for the training (classroom, 10-15 persons/patients aged 50+ for exercise) and arrangements for the field training.
4. Organizing materials required for the survey - books, 'E' charts, measuring tapes, torch, batteries, patient referral slips, pencils/erasers and hard board.
5. Providing advance information to the residents in the selected clusters through the local Health Worker to ensure better coverage of the eligible persons.
6. Assuming the role as one of the supervisors for field work.
7. Assisting the Chief Surveyors in carrying out other tasks to facilitate the smooth implementation of the survey schedule.



### **C. Responsibilities of the Field Supervisors (DOS/DMU Surgeon, Medical Officer/ Resident/ Trained Health Assistant)**

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.

### **D. Responsibilities of the Surveyors (Ophthalmic Assistants):**

1. Participating in the training programme organized by Chief Surveyors covering the methodology of the survey, filling up the proforma and procedures for lens examination and 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 lens examination using torch/retinoscope, visual acuity testing using simplified 'ETDRS' chart & measuring tape and filling up the proforma.
4. Completing the survey in the allotted cluster by covering 100 persons aged 50+ with the assistance of the local helpers.

### **E. 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.

### **F. Field Procedures**

1. Read the survey proforma carefully before starting the survey work. Make sure that all the sections of the proforma are understood. Contact the Chief Surveyor/Field Supervisor for any clarifications required regarding the proforma and the methodology of the survey examination.
2. The code number of the district (provided to Chief Surveyor), cluster number (given

- in the list of the selected units) and the individual number (serially in the book of proforma) can be filled by the OA in advance.
3. Arrange the transport so as to reach the selected village/town area as early as possible, say latest by 9:00 a.m. on the day of the survey. This will help in contacting most of the eligible persons. The list of the selected villages/town areas is firm and no substitution is permissible.
  4. The Field supervisor is responsible for identifying the first household to be surveyed. In all the villages/town areas with a population of less than 1000, the survey can start from the very first household. For the larger clusters, contact a local person to get an idea about the outline of village/town area. Then go to the centre of the village/town area and start the survey following one direction, to be decided by draw of lots. Yet another option for selecting the first household may be a land mark in the village/town area.
  5. In an urban area where the population of the selected cluster is likely to be very large, a map should be obtained. The Surveyors should go to the centre of the place, as indicated in the map and follow one direction, selected randomly.
  6. All the elderly persons in the household, who are likely to above the age of 50 years are to be covered. If there is no person who is aged 50+ in a household, go to the next household.
  7. If a household is locked go to the next one. No entry should be made for the locked households.
  8. Examine all the elderly persons personally. For each person, the best estimate of the age should be assessed and mentioned. The year of Independence of India (1947) is a good reference year for near accurate estimation. Only the individuals aged 50+ should be examined and included in the survey.
  9. If the person is not available for examination, interview a near relative. If eligible, complete the sections 'A' and 'C' of the proforma. The information about the persons not available has to be collected from are responsible and reliable respondent, who must be a member of the same household.
  10. Enter a tick-mark (✓) in the box provided against each correct response. Boxes opposite incorrect responses should be kept blank. No question should have more than one correct response in the box.
  11. Presenting Vision should be tested with ETDRS chart with available glasses (if any) and pinhole. Right Eye first followed by Left Eye.
    - a. At a distance of 4 meters if a person can read at least 4 of the 5 letters of the line corresponding to 6/19, record vision as 6/18 (category 1)

- b. If a person cannot, show the line corresponding to line 6/60. If he/she can read at least 4 of the 5 letters, record vision as 6/60 (category 2). Also note the pinhole vision and record.
  - c. If he/she cannot read at least 4 of the 5 letters of line 6/60, move the chart to 2 meters. If now the person is able to read at least 4 letters, record vision as 3/60 (category 3). Also check with pinhole and record.
  - d. If the person cannot read at least 4 letters of 6/60 lines at 2 meters, vision is  $< 3/60$  (category 4). Check with pinhole also and record.
12. Use the torch initially for lens examination. Find out whether the lens is normal (no obvious opacity), or an obvious opacity is present. Use a retinoscope to confirm the presence of a lenticular opacity. If lens is not present in the pupillary area, mark a tick in box against aphakia.
  13. Whenever a surveyor comes across a case of an operable cataract, he should issue a referral slip with information about the next eye camp in a nearby area.
  14. If the person is aphakic in one or both eyes, the details given under D of the proforma must be entered.
  15. If a tick-mark has been put up in a wrong box or a wrong entry has been made in any of the squares, don't overwrite. Erase the wrong mark with an eraser & put the right mark in the appropriate box. All the entries must be made with a pencil.
  16. Make sure that all the columns in the proforma have been filled up before moving to the next individual.
  17. Once the entire procedure, including the filling up the proforma for an eligible person is complete, the surveyor goes to the next individual/household and repeat the same procedure.
  18. Ensure that all the 100 forms are filled up. That will finish the survey in the 'cluster'.