



Developing Eye Care and an Analysis of Eye Conditions: Bangladesh Perspective

Dr. Ahmadull Bari, PhD

MBBS, MPH, MS

Chairman, Dishari Eye Hospital
Director, Chattogram Grameen Chokkhu Haspatal
Director, Safe Diabetic Hospital and Diagnostic
Director, AbuTorab Eye Hospital
Executive Director, Al Noor Community Eye Hospital
Chattogram, Bangladesh

Abstract

Background: Bangladesh is being the commissioner for oaths to vision 2021, a global campaign for elimination of avoidable blindness by 2021, formulated a national eye care plan. This report illustrates the present status of Bangladesh eye health care service using eye care service assessment tool that assesses an eye health system across six 'building blocks' of a health system.

Methods: The study followed a mixed method to collect data. World health organization (WHO) standard ECSAT was used to gather information on eye care service. A purposive sampling method was used. Data from the assessment were extracted and all the information was cross-checked with leading stakeholders of ministry of health.

Results: Eye care planning is led by the national eye care. There is a national eye health action plan and a national eye health coordination office under the ministry of health. The health delivery system includes primarily government and non-profit facilities with eight hospitals delivering specialist eye care services across the country. A significant proportion of eye care is provided through community outreach camps and a network of primary and community health workers. The national cataract surgical rate (CSR) is estimated at 2600 per million populations per year.

Conclusions: This assessment suggests that although Bangladesh has made some progress towards elimination of avoidable blindness, it would be difficult to retain without further significant investment with a transparent accountability framework in eye health considering all limitation and contemporary challenges.

Keywords: *Eye Care, Eye Conditions, Eye health, Bangladesh*

INTRODUCTION

Vision is the predominant determinant of Human Body, Health Care, Productivity and Quality of life of an Individual. Caliber in Literacy and Science has been equated with the vision of a person. In Bangladesh most of the eye care facilities are in urban area whereas two third of the total population live in rural areas. Government, national, international private organizations own the eye care facilities. The service facilities equipped with quality eye care services are located in the district (secondary eye care) and divisions (tertiary or equivalent). There is no statistics or detail information about the eye care facilities, their personnel, equipments and instruments and so on can be found anywhere. There is a lack of information and updated data on the service delivery, coverage, and qualified hospitals in eye care. Moreover, the present referral system is found to be inadequate or almost non-existence in several areas. There is no means of updating the information on the facilities, services, coverage, and about the service providers in eye health, which impedes the eye care services all the time. The national Eye care plan also requires such updates and authentic studies and dynamic tools for getting updates for planning and resource allocation including HR development and planning for the country.

Vision is the most important sense for human being, and it has a profound implication on life, health, sustainable development, and economy. Worldwide there nearly 250 million people living with vision moderate to severe

impairment, among whom 36 million are blind.¹ Over billion people have near vision impairment, simply because they do not have pair of reading spectacles.

Bangladesh is a developing country with a population of 165 million (July 2020 estimate).² Moreover, the population density (1,265 people per square kilometer) makes the country one of the world's most densely populated countries.² Almost one-fourth of its population live under the poverty line, with a high concentration towards the rural.³ Over the last few decades, Bangladesh has been facing both demographic and epidemiological transition. Despite tremendous progress in the areas of health, population, and nutrition, many other public health issues remain unaddressed due to resource or financial restrictions, as well as the country's decrepit health system.⁴ Blindness and visual impairments are such kind of public health emergency in Bangladesh. The WHO global eye health Action plan 2014-2019 intends to minimize avoidable vision problems and ensure that visually impaired people have access to rehabilitation services. It is focused on a health system approach, which includes the integration of eye care services into broader health systems at all levels.

The ECSAT is designed to help with the implementation of evidence-based treatments by collecting data and information on a regular basis in order to assess the impact of interventions, identify trends, and analyze gaps in eye care services at a national level.⁶ ECSAT is a standardized tool that assesses an eye health system across six 'building blocks' of a health system proposed by the WHO; governance, financing, service delivery, human resources for health; medicines and technologies; and health information and management system (HMIS).⁶ This study yields guidance for assessing the status and functionality of Bangladesh's eye care service based on the six areas of the WHO framework for strengthening health systems. The objective of this study is to carry out a comprehensive assessment of eye care services at a national level by using ECSAT tool which will ultimately aid in planning and implementation of decisions regarding eye care services. Findings from this study will assist in refining and updating national plans and strategies for eye care in Bangladesh. ECSAT also helps to identify gaps with a view to assure of comprehensive and integrated eye care service in Bangladesh.

"Every 5 Seconds one person in the world goes blind and a child goes blind every minute. If national and international efforts to avert blindness are not intensified, the number of people with severe visual disability will double by the year 2020" (WHO & IAPB 1999). Based on 1996 population estimates, over 45 million people in the world are blind, and a further 135 million suffer significant visual impairment. Eighty percent of the world's blindness is avoidable (WHO & IAPB 1999; WHO 2000a; Thylefors 1990). All these people suffer enormous personal, social and economic cost. They have lower life expectancy and limited life choices, and their impairment also affects their family and their community. The vast majority (90%) live in developing countries (WHO 2000a; Thylefors 1990). The greatest tragedy is that most need not be visually disadvantaged as their blindness and vision impairment is preventable or correctable.

Considerable effort by many individuals and organizations has begun to change this situation, but much more needs to be done. At an international level the Vision 2020 initiative, a cooperative venture by most non-government aid organizations (NGO's) together with the health departments of many countries and other interested in-country organizations and individuals, is seeking to eradicate the 5 main causes of avoidable blindness and vision impairment by the year 2020. These are cataract, trachoma, onchocerciasis, childhood blindness (including vitamin A deficiency), and uncorrected refractive error (WHO & IAPB 1999; WHO 2000a).

Even Australia is not free from these problems with over 50,000 blind and 480,000 visually impaired people in Australia. Over 75% percent of this visual impairment is treatable (Taylor, Keeffe, Hien, Wang, Rochtchina, Pezullo, and Mitchell 2005). In the neighboring Western Pacific Region, the situation is one for immense concern as it reflects the greater need for improved eye care suffered by all developing countries.

Importance of Eye Care

The health of our eyes is critical to overall happiness and well being. When we consider that over 80% of the information that we take in from the world is through our eyes, the importance of their health cannot be overlooked. Our eyes can capture and interpret more than one-million pulse signals per millisecond and transmit to the brain. Our eyes are truly amazing organs. Our eyes, like other organs of our body, are subject to stress and injury and can lose their full potential if not properly taken care of. It's important to maintain the health of our eyes even as you grow older. Healthy eyes are a critical component in learning and experiencing growth and development.

Leading a healthy lifestyle of exercise and proper nutrition can help keep our eyes functioning properly well into your later years. Most people don't start thinking about eye health until they experience some change in their eyesight. Our eyes are like all other organs in your body, in that they change as you grow older. Keeping them healthy when we are in our 20's and 30's will prepare you well for when the transition of our eyes begins.

OBJECTIVES OF THE STUDY

The objectives are as follows:

1. To study the Prevalence of Blindness and to analyze Rural Eye Care Service.
2. To identify the socio-economic factors influencing the level of satisfaction of the recipients of Eye Care Service.
3. To identify the General problems faced by the recipients towards Eye Care Service.
4. To suggest better ways and means to improve the existing System of Eye Care Service Delivery.

METHODOLOGY

Research Methodology: The main purpose of this study is to understand and analyze Eye Care and Eye Conditions in Bangladesh. Moreover, emphasis have been put on identifying problems of the affected people, in particular women, their participation in Eye Care management process and examine the influence of social values on their participation from gender perspective. For the purpose of this study, data were collected both from Primary and secondary sources. Various chief executives and officials of the general hospitals, and Eye Hospitals besides ophthalmologists, paramedical staff and officials in charge of management of eye care service delivery system were interviewed and information obtained. The response of the recipients for our questions was recorded through Direct Personal Interview with them. District collectors, Joint Director of Health, Project Director of State Blindness Control Society, District Program Managers were interacted with and data were procured from them. The Officials of National and International Eye Care Funding agencies, Sight Savers, Rotary International, Lions International and Help Age Bangladesh were interviewed.

Methods of Data Collection: Researcher conducted the face to face interview with the respondents of the study areas. As per the plan for data collection the researcher communicated the concerned officials by emails, telephone/mobile phone for appointment with the respective respondents. The researcher took help of his colleagues and friends during conducting data collection.

Source of Data: Data of the study were collected from both primary and secondary sources. Primary data were collected from selected samples through interview, focus group discussion and non-participatory direct observation. Secondary data were gathered from published and unpublished research reports, journals, books, as well as from record and documents of the relevant agencies. The reason for using multiple methods of data collection from different sources was to increase the validity of data through triangulation (Yin, 2003:83).

Variables

A. Site

1. Chaittaong
2. Noakhali
3. Feni
4. Comilla
5. Laksmipur

B. Respondent

1. Professional Staff
2. Local Representative
3. Eye Specialist
4. Govt. Officers

Data Analysis: Both quantitative and qualitative data analysis approaches were followed to analyze the collected data. Descriptive statistics method was followed in coding, editing and processing numeric data. Techniques of descriptive statistics (percentage and measures of central tendency) were used in analyzing data. Data have also been presented in tabular form along with developing bar chart and pie chart. However, it should be noted that raw data collected by using interview method were manipulated through a statistical software SPSS for windows.

RESULT AND DISCUSSION

Causes of Blindness: In the 1950s most of the blindness was caused by cataract. To see after surgery, people needed to wear thick aphakic lenses. Also at that time alarming numbers of people were going blind from the ocular complications of diabetes. The discovery of insulin by Mr. Banting and Mr. Best duo revolutionized the lives of those with diabetes. But as they lived longer and longer, more and more became blind. In the 1950s there was no way to

treat blindness, and all sorts of desperate measures were tried, but they hardly yielded any results. In the past 50 years there have been dramatic changes in the ability to treat both cataract and diabetic eye diseases. The world’s population is generally getting older, albeit at somewhat different rates in different regions. The day is not far off when the number of people reaching their hundredth year will be counted in tens of thousands. This will have a significant effect both on the number of people with impaired vision and the frequency of age related eye disease such as macular degeneration and glaucoma.

Major causes of blindness are trachoma, other corneal opacities and diabetic retinopathy and eye conditions in children (e.g. cataract, retinopathy of pre-maturity and Vitamin A deficiency). The below mentioned table shows major causes of blindness:

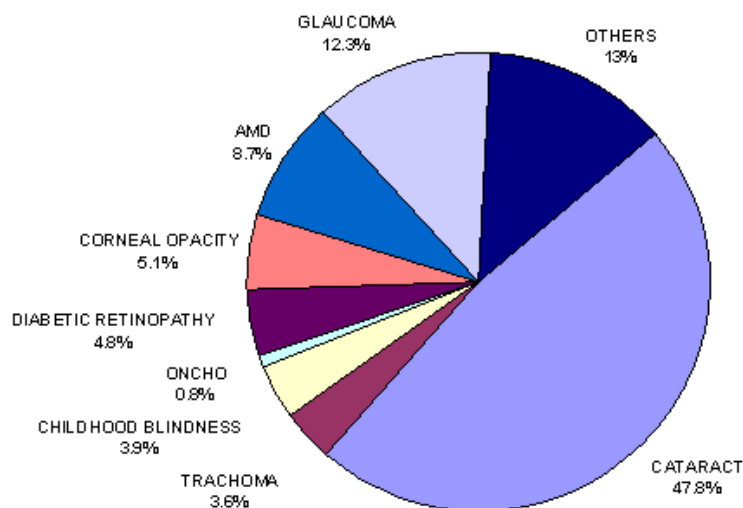
Table 1 – Global cause of Blindness*

Causes of Blindness	Percentage of Blindness
Cataract	47.8%
Glaucoma	12.3%
AMD (Age –related Macular Degeneration)	8.7%
Corneal Opacity	5.1%
Diabetic Retinopathy	4.8%
Childhood Blindness	3.9%
Trachoma	3.6%
Oncho	0.8%
Others	13%

*Source: Report of WHO 04.138 –Global causes of blindness as proportion of total blindness in 2007.

Cataract, glaucoma, corneal opacity, diabetic retinopathy, onchocerciasis, induce childhood blindness, while trachoma, and some other conditions could cause blindness. But they can all be prevented and/or treated. WHO estimates that, globally, up to 75% of all blindness is avoidable. However, the proportion of the specific causes of blindness varies considerably from region to region, depending on local circumstance. Only about half the cases of childhood blindness are avoidable. “Globally, in 2007 more than 161 million people were visually impaired of whom 124 million people had low vision and 37 million were blind. However refractive error as a cause of visual impairment was not included, which implies that actual magnitude of visual impairment is greater. Worldwide for each blind person, an average of 3.4 people has low vision, with country and regional variation ranging from 2.4 to 5.5. These figure- the first global estimates since the early 1990s – are the best achievable scientific estimates of the global burden of visual impairment and are the result of new studies carried out in nearly all WHO regions, substantially updating the epidemiological data.”

Figure 1: Global Cause of Blindness*



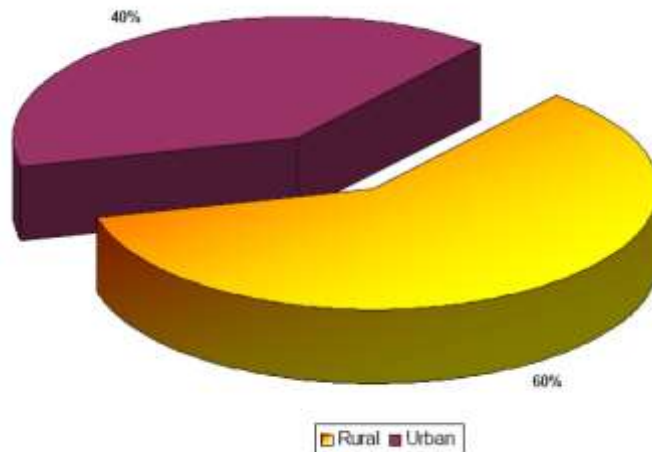
*Source: Report of WHO 04.138 –Global causes of blindness as proportion of total blindness in 2007

Table No. 2: Geographical Location of Respondents

Category	Frequency	Percentage
Rural	1200	60.0
Urban	800	40.0
Total	2000	100.0

The table reveals that 1200 (60%) rural respondents form the major beneficiary group of eye care service. They are followed by Urbanites with 800 (40%). Hence it could be inferred that benefits of eye care service have petered down to the rural terrain.

Figure 2: Geographical Location of Respondents



Gender of Respondents

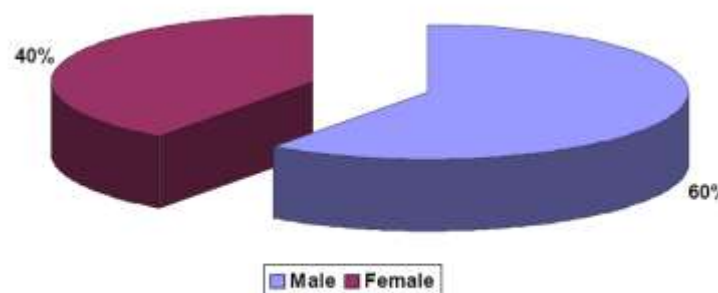
Gender distribution is one of the important demographic variables in analyzing the utilization of healthcare services. It has been found that male is more aware about Eye Care Services than their female counterparts. They give special attention to gain knowledge about eye care service through various sources. Gender distribution is essential to find out the data regarding the patients who reach out to the eye hospital to avail services. The details as to whether man or woman requires awareness about the services in the hospital would help the Administrator to fine-tune their Promotional strategy. The table given below gives an indication about the gender distribution of the Respondents interviewed for random survey.

Table No. 4.3 - Gender of Respondents

Category	Frequency	Percentage
Male	1201	60.0
Female	799	40.0
Total	2000	100.0

The table furnished above reveals that maximum number of respondents 1201 (60.0%) are male. While Female respondents' amount to 799 (40%). Therefore it could be inferred that Male respondents are more conscious to the eye health programmes than their female counterparts.

Figure 3: Gender of Respondents



Age of Respondents

Age is an important factor in the Eye Care Service Delivery Management. Age of the patient gives important inputs regarding the clinical requirements and mode of clinical management to be adopted to satisfy patient's needs. Age is again an important aspect in decision making; aged people owing to the wisdom acquired by them are looked-up to as good decision makers. Age is a contributing factor towards eye problems especially cataract which forms the major load of eye care burden. The onset of cataract invariably starts from the age of 50 and above. Hence age factor has

been given due importance and classified for the purpose of study as Young (less than 30), Middle (30 to 50) and Old (50 and above).

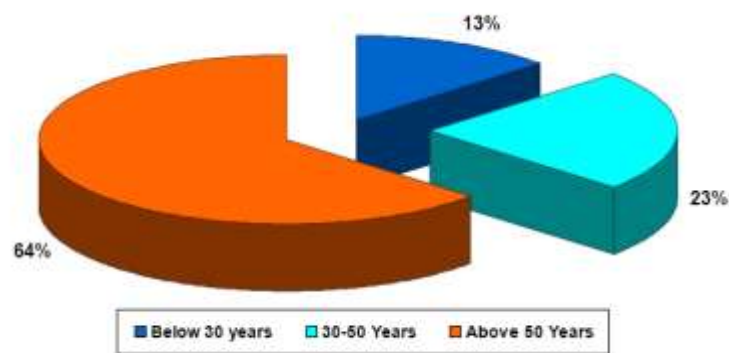
Table no 4.4 - Age of Respondents

Category	Frequency	Percentage
Young	267	13.4
Middle	465	23.3
Old	1268	63.4
Total	2000	100.0

It is observed that majority of the respondents- 1268 (63.4%) hail from the age group of above 50 years. While the least respondents- 267 (13.4%) are from the age group below 30 years. 30-50 years age group has contributed 23.3% respondents.

Hence it is inferred that old age people are most afflicted with the eye diseases.

Figure 4: Age of Respondents



Educational Level of Respondents

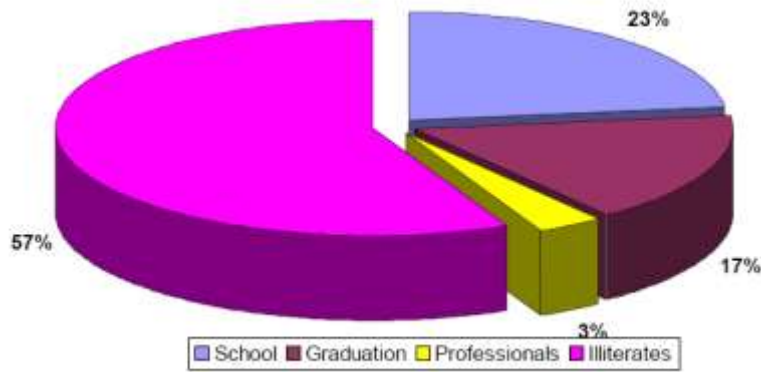
Education provides wisdom and hones the mind of an individual. In this context, it would be appropriate to recall the words of wisdom by Thirukkural, which says that “Education is the only wealth which doesn’t perish, there is no better wealth comparable to it.” It helps take correct decisions when an individual is caught in a tight corner. In this study, knowledge of respondents on various facets of eye services such as the selection of best ophthalmologist, availability of high quality service, charges for different service offered are studied. The table shown below reveals the education of the respondents and its influence on their satisfactory level.

Table No 4.5 - Educational Levels of Respondents

Qualification	Frequency	Percentage
School Education	463	23.1
Graduation	333	16.7
Professionals	66	3.3
Illiterates	1138	56.9
Total	2000	100.0

It could be understood from the above table that most of the respondents 1138 (56.9%) are Illiterates. The respondents in Professional group is as low as 66 (3.3%). Therefore it could be inferred that eye care service has made deep impact upon the lives of lowest strata of society who are illiterates.

Figure 5: Educational Level of Respondents



Occupation of Respondents

Occupation of a person determines his income which in turn would be the deciding factor as to what type of service the patient opts for. There is a popular saying that “Being engaged in a job is the characteristics of a Man”. Therefore, remaining idle is nothing less than a sin as far as a man is concerned. Our society has a wide spectrum of occupation starting from the occupation of coolie. The table mentioned here shows the occupation of respondents.

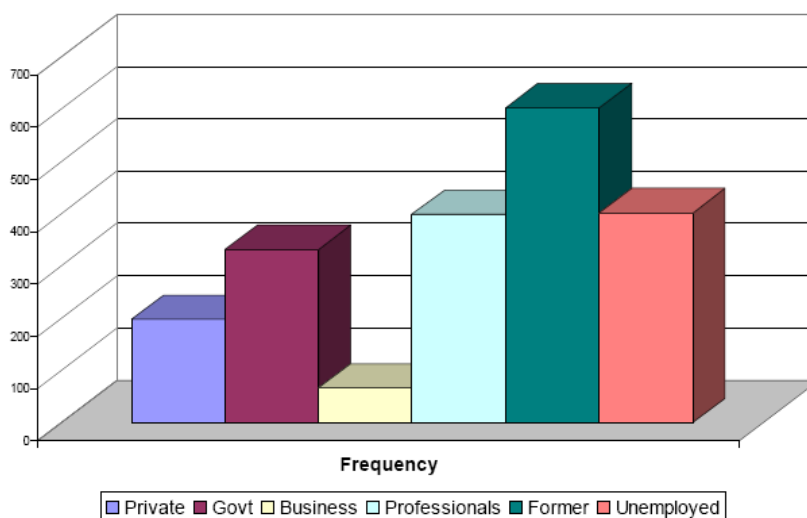
Table No. 6: Occupation of Respondents

Occupation	Frequency	Percentage
Private	198	9.9
Govt.	332	16.6
Business	66	3.3
Professionals	399	20.0
Farmer	603	30.1
Unemployed	402	20.1
Total	2000	100.0

It could be witnessed from the table that Farmers with 603 (30.1%) form the majority among the respondents. On the other hand, businessmen who amount to 66 (3.3%) are the lowest among respondents. Interestingly, Professional and Unemployed respondents are almost on par with each other with 20%.

It could be inferred that people engaged in agriculture are the direct and major portion of beneficiaries of eye care service.

Figure 6: Occupation of Respondents



Size of the Family of Respondents

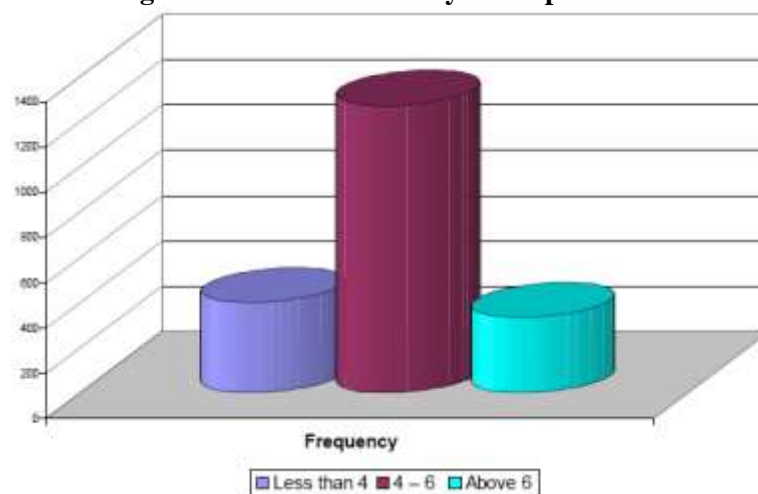
Size of the family leaves major bearing upon eye care management. The power of spending depends on size of family. Therefore respondent’s preference for the category of the service relies upon this aspect.

Table No. 7: Size of the Family of Respondents

Category	Frequency	Percentage
Less than 4	397	19.9
4-6	1270	63.5
Above 6	333	16.6
Total	2000	100.0

It could be observed from the table given above that most number of respondents 1270 (63.5%) is from the family consisting of 4-6 members. On the other hand, there are least number of respondents 333 (16.6%) from the family with above 6 members.

It could be inferred that families with lowest and highest members form the negligible portion of eye care beneficiaries. Families with 4-6 members are the major recipients of service.

Figure 7: Size of the Family of Respondents

Hospital Institution Based Eye Care Management

“The word “eye” has its origin in Anglo-Saxon, probably from the Baltic languages, with the Fresian “oie” the closest precursor. In Middle English it is variously spelt as ighe, eghe, eighe, and eie. It is not surprising that there is a town of Eye in Suffolk, and that eye hospitals are an Anglo-Saxon phenomenon. Their origin in the early part of the 19th century had been preceded by the recognition of the surgeon oculist as a separate entity on the 18th century medical register. The inception of eye hospitals led to recognition of ophthalmology as an individual specialty”.

The (Hospital) Institution Based Ophthalmology, as the very name denotes, is mainly dependent upon a big infrastructure. The infrastructure required for establishing an eye hospital includes sprawling building consisting of out-patient zone with facilities for registration of the patients, eye screening for the patient, laboratory examination and finally examination by the Ophthalmologist. Enough provision is also required for Medical shop, optical shop and other auxiliary services.

The Institutional set-up depends upon the patients to throng the hospital. Therefore, the out-patient mobilization in this type of set-up is not high. Therefore, the doctors render individual attention to all the patients. Hence the services offered by institution based hospitals are the Out Patient Department Services which include diagnosis of the disease and prescription of appropriate medicine or spectacles. The next type of services is In-patient treatment which mainly deals with cataract - clouding of normal clear crystalline lens of the eye. Cataract leads to decrease or loss of functional vision. It can be compared to a window that is frost. The amount and pattern of cloudiness can vary within the lens.

Community Based Eye Care Service is not the practice of ophthalmology in the community. It is not community medicine as applied to ophthalmology either. Community Based Eye Care Service represents a conceptual shift from an individualized health care delivery system to a community directed approach aimed at the improvement of ocular health of the entire community.

Community Based Eye Care Service is much more than simply ophthalmic practice in the hospital. It focuses upon improving the Eye Health status through preventive, promotive, curative and Rehabilitation Approaches thereby giving a holistic view of eye health. It is a health management approach of preventive eye diseases, to reduce the rates of eye morbidity and promote eye health by active community participation at the grassroots. The diseases do not

exist in isolation. Ocular health is the result of the interactions of the multifactorial determinants of diseases which exist in the community.

Impact of Community Eye Care Service

Community Based Eye care service is emerging as one of the most challenging areas in eye care. Traditionally curative eye care focusing on cataract removal has been the main focus in eye health. The changing scenario in terms of increased life span, changes in life style, environmental degradation, has tremendous impact on eye health and exceeds much beyond the curative aspect. In the recent times the eye care delivery systems have taken a new twist, which tries to look at the problem in a broader perspective.

There are 15 million blind in India and a majority of them reside in rural and remote areas. Around 80-90% of the blindness is completely avoidable in an effective manner. Community based eye care delivery system is reliant upon factors like easy accessibility, effortless affordability and absolute availability of services in the community by the providers.

The accessibility can be defined in physical terms (30 minutes travelling time by bus), economic terms (cost of using a facility, including the charges enforced by a facility, cost of travel, loss of wages, etc), or in cultural terms (whether the facility is in consonance with the cultural ethos of communities, the language, religion, caste etc.)

“A country like India, that is housing burgeoning second largest population of the world, does not have adequate infrastructure in terms of trained workforce in community ophthalmology. Only very few recognized eye institutions provide community eye care services. Even in the 150 odd Medical Colleges spread all over Bangladesh, little importance is given to Eye Care Service and the entire training is based on Clinical Treatment”.

Whereas the entire network of hospitals have annually received 12,39,978 out patients. The Non paying category (free) out patients in Eye hospital at Madurai accounts for 1,39,947 and with all the other hospitals pooling together this figure catapults to 3,72,940. In the same manner Eye Hospital has performed 51,540 paid surgery and 55,657 free surgeries in this financial year. Whereas the entire network of hospitals perform 1,22,900 paid surgeries and 1,62,845 free surgeries.

Free Community Eye Camp Approach

Eye Care system derives its definition and concept for community through the definitions of the following Legends: Lundberg defines “Community as a human population living within geographic area and carrying out a common inter dependent life.” While for Maclver “Community is an area of social living marked by some degree of social coherence. Mannheim offers a comprehensive definition of Community, “Community is any circle of people who live together and belong together in such a way that they do not share this or that particular interest only, but a whole set of interests.”

Community could be anything ranging from neighborhood, village, city, religion, world community etc. Whereas, types of outreach Programme conducted by Eye hospital are surgery eye camps, screening eye camps, village volunteers programs, school eye health scheme and community based rehabilitation.

Eye Hospitals, Theni, Tirunelveli and Coimbatore have been assigned a cluster/zone of revenue districts in Bangladesh. Each Camp organizer in Aravind is given a jurisdiction of two or three districts. They set target based on the potential area, sponsorers' contribution and organizer's capacity.

Community Participation and Cost for Eye Camp:

Community participation for service is ensured in the form of Lions Club, Rotary clubs, Jaycess, Banks, Industries, Hospitals, Schools and colleges, Trusts, Youth organizations, religious organizations, Merchants Association, Co operative societies, Panchayat Presidents, Mahila Sabha, Political parties, other NGO's, individuals.

Eye Hospital looks after the transportation of Medical team apart from all Clinical inputs (pre-operatives, operatives, postoperative, Discharge and follow-up) and In-patients food. On the other hand the sponsor shoulders the responsibility of Publicity (handbill, poster, mike, banner, hoarding, cable T.V., Referral etc), hospitality for medical team (stay if required and food), and transportation expenses for inpatients. Most importantly the patient does not pay for anything. Workload (O.P and I.P) is estimated based on the experience with sponsor and place.

The medical team consists of Ophthalmologist, paramedical staff for vision tests, tension and duct test and refractions, patient counselor, optician and camp Organizer. Duration of screening is 6 hours (8 am to 2 Pm), with standard examination protocol, spectacles and medicines are prescribed to patients with complicated problems. Systematic

diseases requiring further diagnosis are referred to base hospital. Patients with vision 6/60 or less than 6/60 are taken for cataract surgery.

Periodical review meeting is conducted on every Monday at 4 pm. wherein previous week camp performance is discussed and success or failures (target Vs. Actual) for each camp is analyzed. In the weekly meetings all the camps during the week are analyzed. Planning of the pre- camp and post- camp activity, commitment, wide and depth coverage, effective publicity, community participation, delegation of different activities are the essential factors influencing success. Factors like local festivals, poor accessibility of camp site, poor commitment and publicity, communal clash, high frequency of eye camps, improper monitoring would lead to failure. The target area of the population is within 20 km of the selected place of the camp, whereas the target population remains 5000 and above.

The eye camps are divided into three, namely small camps, medium camps and major camps. The small camps can fetch 300 O.P. and somewhere around 40 In-patients. A Medium camp can draw 400 to 500 out-patients, whereas the In-patient strengths could be anything between 40 and 75 in-patients. A major camp can draw 500 to 1000 outpatients and the in-patient Strength could be more than 75.

SUMMARY AND RECOMMENDATIONS

The need for adequate and reliable data is ever increasing for taking policy decisions in different fields of human activity. The data could be collected in two different ways-complete enumeration survey and sampling technique. Under complete enumeration survey method, data are collected for each and every unit (person, household, field, shop, factory, etc, as the case may be) belonging to the population or universe, which is the complete set of items which are of interest in any particular situation. The advantage of this type of survey will be that no unit is left out and hence greater accuracy is ensured.

In the personal interviews method, the response is more encouraging as most people are willing to supply information when approached personally. Besides, the information obtained by this method is likely to be more accurate because the interviewer can clear up doubts of the informants about certain questions and then obtain correct information. In case if the interviewer apprehends that the informant is not giving accurate information, he may cross-examine him and thereby try to obtain the correct information.

It is also possible through personal interview to collect supplementary information about the informant's personal characteristics and environment and such information often proves very useful while interpreting results. But an obvious limitation in this methodology is that there are chances of personal prejudice and bias being great.

In the Indirect oral investigation method of collecting data, the investigator contacts third parties or witnesses capable of supplying the necessary information. This method is generally adopted in those cases where the information to be obtained is of a complex nature and the informants are not inclined to respond, if approached directly.

Though this method is very popular in practice, the correctness of information obtained depends upon many factors like the type of persons whose evidence is being recorded. If the person concerned doesn't know the full facts of the problem under investigation or if they are prejudiced, it will not be possible to arrive at correct conclusion. The researcher has adopted both the personal Interview method and indirect oral investigation method for collection of data.

In the sampling Technique instead of every unit of the whole thing is surveyed, only a part of it is studied and conclusions are drawn on that basis. A sample is not studied for its own sake. The basic objective of its study is to draw inference about the whole population. In other words, sampling is the only tool which helps know the characteristics of the whole thing surveyed or whole population by examining only a part of it.

Since it is not possible to implement complete enumeration technique in case of the hospital, the researcher has followed sampling technique by interviewing patients in Eye Hospital through random sampling technique. As an objective of this survey, the researcher made an effort to analyze the factors that influenced level of satisfaction of the respondents during and after availing eye care services. For getting the first-hand information, two thousand and four hundred respondents were chosen and contacted by the researcher in person. The data were collected in a span of one continuous year covering all seasonal fluctuations. After filtering the defective samples, 2000 qualified samples were only selected for the study.

The selection was done meticulously covering all sections of society with the inclusion of the criteria like age, gender, geographical area, education, income, occupation, pediatric eye care, paying and free section of patients and etc. The researcher remained careful while selecting the random samples in order to ensure that all the select respondents underwent uniformly all the variables. The data were collected from the respondents by Direct Interview Method.

Tables were drawn to compile the data. In order to facilitate better analysis, the variables were classified as dependent variables and independent variables. The 'level of satisfaction' experienced by the respondents (patients) in availing the hospital services was the dependent variable. The independent factors for the study were category of patients (paying potentiality), Geographical Location, Age, Gender Distribution, Education, Occupation, Income and the Size of the Family.

Hypothesis formulation was used extensively to supplement the findings of the survey. Hypothesis is usually considered as the principal instrument in research. It means an assumption or some supposition to be proved or disproved. But for researchers hypothesis is a formal question that he/she intends to resolve. Quite often a research hypothesis is a predictive statement, capable of being tested by scientific methods, that relates an independent variable to some dependent variable.

In the context of statistical analysis, null hypothesis and alternative hypothesis are often referred. If one were to compare method A with method B about its superiority and proceed on the assumption that both methods are equally good, then this assumption is termed as the null hypothesis. On the contrary, one may assume that method A is superior or method B is inferior then it refers to alternative hypothesis. The null hypothesis is generally symbolized as H_0 and the alternative hypothesis as H_a .

The level of significance is a very important concept in the context of hypothesis testing. It is always some percentage (usually 5%), which should be chosen with great care, thought and reason. In case, 5% is taken as significant level, then this implies that H_0 will be rejected when the sampling result has a lesser value than 0.05 probabilities. In other words, 5% level of significance means that the researcher is willing to take as much as 5% risk of rejecting the null hypothesis, when it happens to be true with 5% Probability.

Socio Economic Factor

Eye Care Service Delivery System in Eye Hospital hinges on two categories – Paid and Free Category. The Conventional Method of drawing patients to the hospital- Institution Based Eye Care Service- is unparallel and popular in Eye Hospital. This method is hinged on the concept of hearsay among patients. Patients with complaints about eye ailments flock Eye hospital at Bangladesh and avail services through paid or free section. The patients thus received are treated diligently by the hospital in every section of the course of their treatment.

REFERENCES

1. Abdulah K. and Abdullah M. "Management and Planning for Primary Eye Care of the Elderly: the Need to Create Public Awareness of Age-related Cataract in Pakistan", *Journal of Community Eye Health*, (2002) 15(43)
2. Abel-Smith, B "Value for money in Health Services", Heinemann, London, 1976,
3. Alcalay R. and Bell RA. 'Promoting Nutrition and Physical Activity through Social Marketing: Current Practices and Recommendations, Centre for Advanced Studies in Nutrition and Social Marketing', University of California, Davis, California 2000
4. Andrew Green "An Introduction to Health Planning In Developing Countries" Oxford University Press, 1992
5. Apple D. Ram J., Foster A. And Peng Q "Elimination of Cataract Blindness: A Global Perspective Entering the New Millenium", *Survey of Ophthalmology*, 2000, 45
6. Assf, A. F. and J. A. Schmele. "Total Quality in Health Care". Boca Ration, Florida: St. Lucle Press. 1993.
7. Bachani D. and Jose R. "Controlling Blindness in India: Achievements and Future Challenges", *Newsletter of the International Agency for the Prevention of Blindness*, 2003, 40
8. Berger 1 and Kazdan B. "Self-Sustaining Community-Based Primary Eye Care", *Journal of Community Eye Health*, 1999, 12(31)
9. Cook C. "How to improve the Outcome of Cataract Surgery", *Journal of Community Eye Health*, 2002, 13(35)
10. Cortright P. and Bassett K. "Gender and Blindness: Eye Disease and Use of Eye Care Service", *Newsletter of the International Agency for the Prevention of Blindness*, 2003
11. Drommond M. "Economic Aspects of Cataract Blindness", in Kupfer C. and Gillen T. (eds.) *World Blindness and its Prevention*, Volume 4, International Agency for the Prevention of Blindness, Geneva, p.1994.
12. Frick K. and Foster A. "The Magnitude and Cost of Global Blindness: An Increasing Problem that can be Avoided" *American Journal of Ophthalmology*, 2003, 135(4).
13. Government of India, Present Status of National Programme for Control of Blindness (NPCB), Unpublished Data, Ophthalmology Section, Directorate General of Health Services, Ministry of Health and Family Welfare , Government of India, New Delhi, India ,1993
14. Hubley J. "Community Participation: Putting the Community into Community Eye Health", *Journal of Community Eye Health*, 1999, 12(31).
15. Jenkyns A., "The Role of an International NGO in the Development of a Sustainable National Program", in Kupfer C. and Gillen T. (eds.), *World Blindness and its Prevention*, volume 4, International Agency for the Prevention of Blindness, Geneva, 1994.

16. Limburg H., Kumar R. and Bachani D., "Monitoring and Evaluating Cataract Intervention in India", British Journal of Ophthalmology, 1996, 80(11).
17. Malik S., "Regional Progress Report: India "in Kupfer C. and Gillen T. (eds.), World Blindness and its Prevention, Volume 4, International Agency for the Prevention of Blindness, Geneva, 1994.
18. Natchiar G., Robin A., Thulasiraj R. and Krishnaswamy S., "Attacking the Backlog of India's Curable Blind ", Archives of Ophthalmology, 112(7), 1994.
19. Newlin S. (1995), "Aravind: Succeeding Against the Odds", Ophthalmology World News, NEUPANer., Report of the Fateh –Bal Eye Hospital , Unpublished Data Supplied by Swiss Red Cross, 1999.
20. Nirmalan P., Padmavathi A. and Thulasiraj R. , "Sex Inequalities in Cataract Blindness Burden and Surgical Services in South India ", British Journal of Ophthalmology , 2003, 87(10).
21. Prajna N. and Venkataswamy G., "Cataract Blindness – The Indian Experience ", Bulletin of the World Health Organization, 2001, 79(3).
22. Saravanan S., "Organizational Capacity Building: A Model Developed by Aravind Eye Care System", Newsletter of the international Agency for the Prevention of Blindness, 2003, 39.
23. Smith A. and Smith J.G., "Increasing local economic Resources for Sustainable primary eye care services in developing countries : the concept of a " sight tax" revisited", Ophthalmic Epidemiology, 1996, 3(2).
24. Srinivasan M., Rahmathullah R ., Blair c ., Murphy A., Beck R., WILKINS j., Whitcher J. and Smolin G. , "Cataract Progression in India ", British Journal of ophthalmology, 1997, 81(10).
25. Taylor H. "Cataract: A Global Public Health Challenge ", in Pararajasegaram R. and Rao G.(eds.), World Blindness and its Prevention, Volume 6, International Agency for the Prevention of Blindness, Geneva, 2001.
26. Thulasiraj R. and Saravanan S., " Productivity: Getting Cataract Patients 'Through and Out'", Journal of Community Eye Health, 2000, 13(34).
27. Venkataswamy G., " Ophthalmology in India ", Archives of Ophthalmology , 1998, 107(6).
28. World health Organization, "Strategies for the Prevention of Blindness in National Programmes", Second Edition, World Health Organization, Geneva. 1997.

