

# Models for Primary Eye Care Services in India

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## ABSTRACT

Blindness and visual impairment continues to be a major public health problem in India. Availability and easy access to primary eye care services is essential for elimination of avoidable blindness. 'Vision 2020: The Right to Sight — India' envisaged the need for establishing primary eye care units named vision centers for every 50,000 population in the country by the year 2020. The government of India has given priority to develop vision centers at the level of community health centers and primary health centers under the 'National Program for Control of Blindness'. NGOs and the private sector have also initiated some models for primary eye care services.

In the current situation, an integrated health care system with primary eye care promoted by government of India is apparently the best answer. This model is both cost effective and practical for the prevention and control of blindness among the underprivileged population. Other models functioning with the newer technology of tele-ophthalmology or mobile clinics also add to the positive outcome in providing primary eye care services. This review highlights the strengths and weaknesses of various models presently functioning in the country with the idea of providing useful inputs for eye care providers and enabling them to identify and adopt an appropriate model for primary eye care services.

**Keywords:** Primary eye care, tele-ophthalmology, vision center

## Introduction

According to World Health Organization (WHO) estimates, there are 39 million blind and another 246 million visually impaired people in the world.<sup>(1)</sup> The burden of blindness in India contributes to nearly one fifth of the global blindness burden.<sup>(2)</sup> Cataract and refractive errors constitute more than 80% of the blindness and are largely avoidable.<sup>(3)</sup> Despite gains witnessed in global blindness elimination efforts, the current figures reflect the need for a sustained effort to achieve the goal of elimination of avoidable blindness as envisioned by 'Vision 2020: The Right to Sight' by the year 2020.<sup>(4)</sup>

India has demonstrated a strong commitment towards the reduction of prevalence of overall blindness.<sup>(5)</sup> India was the first country to initiate the National Program for Control of Blindness (NPCB) in 1976.<sup>(2)</sup> Despite achieving a high cataract surgical rate of over 5000 surgeries per million population recently, the load of blindness due to cataract is still high.<sup>(2)</sup> Similarly, refractive errors remain a formidable challenge that needs to be addressed. Due to a rise in risk factors, diabetic retinopathy and glaucoma are also emerging as important conditions that need to be addressed at all levels of health care.

Principally, primary level eye care aims to deliver affordable services to all, irrespective of the socio-economic abilities of individuals.<sup>(6)</sup> Primary eye care largely refers to a combination of activities encompassing promotive, preventive, therapeutic and rehabilitation services delivered at community level to avert serious sequels resulting in blindness.<sup>(7,8)</sup> Since primary eye care is a by-product of larger primary health care, it retains its basic principles of community participation, inter-sectoral co-ordination, use of appropriate technology and equitable distribution of resources.

Access this article online	
Quick Response Code:	Website: www.ijcm.org.in
	DOI: 10.4103/0970-0218.153868

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**Received:** 04-02-14, **Accepted:** 20-06-14

The components of primary eye care include raising adequate awareness about eye health and the prevention of common eye diseases through health education.<sup>(9)</sup> Many of the eye conditions such as trachoma, nutritional blindness due to vitamin A deficiency and corneal injuries can be prevented by following simple steps such as -face washing, consuming a vitamin A-rich diet and by taking appropriate care while playing, farming or celebrating festivals like Holi or Diwali. Primary eye care also includes timely detection of common eye diseases such as cataract and refractive errors, the leading causes of visual impairment. Refractive errors can be addressed effectively by ophthalmic assistants through the primary eye care delivery network by provision of spectacles. Screening targeted to identify diabetic retinopathy and glaucoma can also be initiated at this level with provision of essential equipment and adequate training. The patients identified with diseases should be referred to appropriate secondary and tertiary levels for further management. Rehabilitation of people with blindness and low vision can also be carried out at the primary eye care level itself. It is recognized that a majority of cases with avoidable blindness can either be prevented or treated by efficient utilization of existing resources in the community and through creating eye health promotion programs.

In 2004, India adopted 'Vision 2020: The Right to Sight' program following a global movement, reiterating the commitment towards elimination of blindness by the year 2020 by establishing 20,000 primary eye care units.<sup>(4)</sup> These units called 'vision centers' act as the first point of interface of the population with skilled, comprehensive eye care service providers.<sup>(10)</sup> The program has achieved increased public awareness, professional and political commitment for the prevention of blindness.<sup>(11)</sup> In India, 4000 vision centers in 10<sup>th</sup> Five year plan<sup>(12)</sup> and 5000 vision centers in 11<sup>th</sup> five year plan<sup>(13)</sup> were to be established but the targets could not be achieved. Recently, the twelfth five year plan (2012-17) has committed to developing 5000 vision centers with revised strategies to achieve the targets.<sup>(14)</sup>

India, being a vast, heterogeneous country on many fronts needs diverse primary eye care development plans. Currently, primary eye care (PEC) services are delivered through varied models of eye care. It is imperative that these working models be reviewed to assess their strengths and weaknesses and their potential contribution in reducing the blindness burden. This article reports the salient attributes of primary eye care models with the aim of disseminating this information widely for customization of these models in different settings of the country.

## Delivering Primary Eye Care Through Various Models

Models for primary eye care reviewed here are primarily divided into two broad categories based on their working operations which may be through fixed facilities or mobile services. Fixed facility primary eye care in primary health care (PHC) centers is commonly provided through fixed or permanent structures available under the government health delivery system. Non-governmental organizations have adopted different models involving stand-alone primary eye care through fixed facility or mobile units.

### PEC services through fixed centers

Health facilities designated to deliver eye care services through stand-alone centers or within the primary health care services are discussed here.

#### *Integrated primary eye care services within primary health centers*

The government of India envisages delivery of primary eye care through the infrastructure and human resources available at primary level under the integrated health care delivery system. The primary eye care facilities are to be located at the community health care (CHC) level (for one lakh population) or PHC level (for a population of 30,000) where there are no surgical specialist services available. 'Vision 2020: The Right to Sight – India' has recommended vision centers for every 50,000 population.<sup>(15)</sup> The Para-Medical Ophthalmic Assistant (PMOA) is the key person who provides eye care services and is trained in conducting refraction and screening of common ocular conditions. The integration of eye services with routine health care service delivery offers the advantage of using existing resources thus ensuring sustainability. Apart from PMOA, the Medical Officer (MO) can provide management for common ocular conditions. The paramedical health workforce can maintain village-wise blind registers thereby ensuring referral for visually impaired persons. Ever since the National Rural Health Mission (NRHM) aiming at architectural correction of health system in India has been launched, the health systems have witnessed great improvement.<sup>(16)</sup> Community level volunteers like Accredited Social Health Activist (ASHA) workers if appropriately trained and sensitized, could be tapped for channelizing patients to avail primary eye care services in local vicinities.<sup>(13)</sup> Their work can be supervised by the PMOAs and MOs.

The government of India (GOI) has earmarked INR 50 crores under NPCB for development of vision centers during the 12<sup>th</sup> five year plan.<sup>(14)</sup> In future, the challenge remains to make the vision centers functional so as to enhance the reach of primary eye care services. The GOI

is committed to providing a non-recurring assistance up to Rs one lakh for basic equipment for refraction and screening of other eye diseases, furniture, fixtures etc. Grant-in-aid (GIA) would be used for vision centers in PHCs in government and voluntary sectors.

#### **Stand alone primary eye care services**

Outside the public health infrastructure provided by the government of India, many eye institutes are providing community level eye care through stand alone primary eye care centers. LV Prasad Eye Institute<sup>(17)</sup> (LVPEI) in Andhra Pradesh is providing primary eye care services in fixed facility vision centers through vision technicians. The LVPEI serves a population of nearly 15 million through 95 vision centers.<sup>(17)</sup> The vision technician (VT) is a high school graduate with one year training in optometry. VTs screen the population for blinding eye conditions, conduct refraction and refer patients to higher level centers for further management. He is supported by Village Health Guardians (VHG) a community level worker selected from the local community for every 5000 population. They identify the patients for cataract surgery at primary eye care level, take them to the base hospital and help them till the follow-ups at the vision centers. VHGs also provide presbyopic spectacles for near vision to the aged population in the community. This is a unique referral model in private eye care institutions linking primary to tertiary level eye care.

Sadguru Netra Chikitsalaya, Chitrakoot<sup>(18)</sup> (SNCC) Madhya Pradesh also has 24 vision centers to provide primary eye care services for largely a rural population. Aravind Eye Care System (AECS)<sup>(19)</sup> has 40 vision centers in various districts of south India.

This model is projected to replace regional eye camps and to administer primary eye care services to enable the base hospital to focus on secondary and tertiary eye care.

#### **Special settings like services in urban slums and tribal population**

Urban areas are dotted by slums with the dwellers living in disadvantaged conditions. Despite the availability of eye care services in urban areas, the poor population residing in urban slums has no access to it owing to low awareness and financial constraints.

The Community Ophthalmology Department at the 'Dr. Rajendra Prasad Center for Ophthalmic Sciences, All India Institute of Medical Sciences (AIIMS),<sup>(20)</sup> New Delhi is rendering community eye care services through 20 primary eye care (PEC) centers, serving a population of nearly one million in the urban slums of Delhi. More than 40,000 beneficiaries avail the primary eye care services annually through these vision centers. The PEC centers are situated at fixed locations and are managed

either by community based organizations (CBOs) or the government sector. This model consists of a team comprising an optometrist and two field workers who visit once or twice a week as per the need of the community in the different slum clusters. The optometrist conducts basic eye examinations along with the prescription of spectacles which are subsidized and arranged at the vision center. Patients screened for cataract surgery or other ocular diseases are referred to the base hospital for free investigations and treatment through the community eye care services program. The other activities include training of local volunteers in primary eye care, health education events in the community and school screening programs to promote the community partnership and awareness about eye care. An almost similar model is adopted by the 'Kolkata Urban Comprehensive eye care Project (KUCECP),<sup>(21)</sup> and Mumbai eye care campaign (MECC).<sup>(22)</sup> Both the programs are implemented in partnership with Sightsavers under Standard Chartered's 'Seeing is Believing' program. KUCECP has 11 vision centers while MECC provide primary eye care services through 15 vision centers.

#### **Mobile primary eye care services**

Providing primary eye care services through mobile vans or through tele-ophthalmology is a rapidly emerging strategy for improving eye care delivery in the country and enhancing access to services in difficult to reach areas and rural India.

#### **Primary eye care through mobile vans**

In some areas, primary eye care is delivered through use of mobile vans. An ophthalmic technician with support staff and a vehicle can be utilized for reaching underserved areas and bridging geographic inequities for eye care services. A range of primary eye care services are currently provided through mobile units depending on sophisticated design, equipment and skilled manpower deputed to provide services. The model is commonly developed for identifying diabetic retinopathy cases among the diabetics. Certain units also provide management of diabetic retinopathy by provision of laser therapy in the mobile vans. Emphasis is laid on an efficient referral system so that all identified cases may be referred for further management at a higher level. The project 'Nayantara',<sup>(23)</sup> Tiupati eye center, NOIDA, Uttar Pradesh, has mobile eye examination and treatment units, which have an inbuilt fundus camera and laser as well. The service through one equipped van is provided in five districts in Western Uttar Pradesh through a network of private practitioners. The retina specialist travels along with the team, which serves as an added invaluable resource. The diabetic retinopathy suspects are generally referred by the local physicians, diabetologists and ophthalmologists who may not have all latest equipment in remote rural areas.

### Primary eye care through tele-ophthalmology

India has been a pioneer in developing and initiating tele-ophthalmology for eye care.<sup>(26)</sup> This facility can be made available at the fixed center as well as from the mobile vans. Tele-ophthalmology utilizes internet-based information technology, allowing the health care provider/patient to have contact with an ophthalmic specialist at base hospital via video conferencing. This helps the patients consult a specialist without travelling and thus bridges the gap of inaccessibility of services. An ophthalmic assistant (OA) is posted at primary eye care centers that examines the patients and feeds information to the ophthalmologist at the base hospital. One of the best examples under government public health system practicing tele-ophthalmology services is that of Tripura,<sup>(25)</sup> where 40 vision centers are linked to tele-ophthalmology mobile services. The project has decentralized the eye care system and has also reduced the burden of secondary level hospitals.

This model is adopted by Aravind Eye Care System<sup>(19)</sup> (AECS), Madurai, Sankara Nethralaya,<sup>(26)</sup> Chennai and many more in different parts of India, mainly by private organizations. Nevertheless, tele-ophthalmology is proving to be an effective model for delivery of primary eye care services to the underserved population where access to an ophthalmologist is a significant obstacle.

## Discussion

The approach of providing primary eye care at the community level in rural and underserved urban areas through various models is a promising strategy in creating awareness and reducing the burden of avoidable eye diseases. All the models described above have varying strengths and limitations owing to their unique approaches. The operational sustainability of all vision centers depends on various factors such as the quality of the clinical staff, as well as the administrative and efficient managerial skills of other supportive staff members.

The integrated model of primary eye care services with primary health centers and community health centers is cost effective and most suited for our country. The major advantage of the model is that the eye personnel can work under the guidance of trained medical officers and the eye care services are provided in the already existing health care infrastructure. It is important to give emphasis on the integration of primary eye care services with primary health care services. With logistic support from the GOI, this model appears to be successful, cost effective and adaptable for primary eye care services in India. Provision of quality spectacles should be an essential component of the model. But even after a special initiative in the previous five year plans, the

vision centers could not be established as per the need and proposed targets. The key reasons could be the lack of availability of PMOAs, deprived facilities, lack of financial support, poor maintenance of equipment, unskilled and undisciplined staff or even a priority to other areas of eye care.

Considering the current shortfall of ophthalmic assistants, it is suggested that we should first target the development of vision centers for every one lakh population in all CHCs in the country. One trained PMOA with a minimum of two years of experience should be posted in each vision center. The PMOA from CHC may also manage primary eye care services at the PHCs falling under his CHC. Some leading eye care institutes have initiated a one year training course instead of the regular two year courses in order to fill the gap of trained manpower at the vision center level. This may not be an appropriate solution and could lead to deterioration in the quality of services. Therefore, it is suggested to start more number of optometry institutes with minimum two years of training course as recommended by Government of India. NPCB has registered more than 2000 NGOs for cataract surgical services. It is also recommended that those NGOs with available trained optometrists should be promoted to adopt vision centers in the Government CHCs/PHCs. Beside this, the optometry students during their internship period may also be posted at the VCs in the field practice area of their optometric colleges. This will help to orient them to rural health and the eye care delivery system. Other community based healthcare volunteers already involved in primary health care should also be trained in primary eye care. These include ASHA, Auxiliary Nursing Midwives (ANMs), Aganwadi workers and Health workers.

The mobile tele-ophthalmology model is believed to be most efficient as it facilitates early detection and identification of specific ocular conditions such as diabetic retinopathy. It could be a sustainable model as it saves lot of travel costs and time for the patients as well as the eye specialists. In a study where the utility of a static facility was compared with a mobile facility, the mobile facility was found to be more effective as it provided eye care services to a larger population with an almost similar set-up and even recovered the recurring expenses in a short time.<sup>(27)</sup> Although it is arguably an excellent model for eye care services, huge capital investment initially is a major challenge for this model. Sometimes there may be difficulty in obtaining high quality images. This model can be viable with internet facilities only and may be sustained if the existing staff is technically competent to use this set-up. Technology failure at the time of running the PEC services may lead to dissatisfaction among community members and a huge gap in co-ordination.

Continuous training at all levels is an essential component of providing quality services. Ongoing training and assessment enables individuals to develop competencies among themselves. Poor work knowledge and skills display inadequate training, leading to dissatisfaction among patients and ruining the entire effort.

On the other hand, one of the major aspects for the operational sustainability of the vision centers is to carry out regular monitoring of the entire set up. Routine monitoring helps to ensure optimal performance of the staff members as well improved output of the vision centers. It is recommended that a Management Information System (MIS) for providing reporting services at vision centers should be formed. They can also have indicators related to primary eye care and refraction services, for instance the number of refractions performed, number of spectacles dispensed etc. A monitoring visit by the ophthalmologist is essential at least once a month in a vision center to ensure availability of appropriate skills and services.

For a long term sustainable model, support from NPCB, funding from non-government sources, a nominal user fee, earnings from spectacles, community participation and revenue generation through referred patients in the base hospitals are some of the strategies. These may be adapted for different situations as well as different type of models.

A very good referral co-ordination with secondary and tertiary eye care hospitals is also a crucial component of the primary eye care services. Lack of efficient co-ordination can lead to a high level of dissatisfaction among patients who do not get the appropriate level of referral services for advanced management of the disease.

The key aspect for the success of any vision center is patient satisfaction which may be attained by providing quality services, utilization of updated technology, accessibility (cutting travelling costs) and effective counseling at vision centers. Sustainability of primary eye care services through various models in urban or rural communities principally depends on its pre-defined and well thought approach. All important aspects like funding, community participation, availability of the local human resources and their training, monitoring and performance indicators should be prepared in advance for creating the sustainable primary eye care model. Thorough understanding of the community structure, their cultural and social beliefs, level of awareness about eye care is another important aspect for setting up any vision center in a specified community.

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**How to cite this article:** Misra V, Vashist P, Malhotra S, Gupta SK. Models for Primary Eye Care Services in India. *Indian J Community Med* 2015;40:79-84.

**Source of Support:** Nil, **Conflict of Interest:** None declared.