Eye Health System Assessment Cambodia

2013

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Contents

Acronyms

BED	Basic Eye Doctor
BEN	Basic Eye Nurse
ED	Eye Doctor
TOT	Training Of Trainer
EHSA	Eye Health System Assessment
VHV	Village Health Volunteer
HC	Health Center
RH	Referral Hospital
NPEH	National Program for Eye Health
COS	Cambodia Ophthalmological Society
CSR	Cataract Surgical Rate
CME	Continuing Medical Education
NEML	National Essential Medicine List
THE	Takeo Eye Hospital
CPA	Complementary Package Activities
MPA	Minimum Package Activities
HSP2	Health Sector Program 2
IPD	In-Patient Department
OPD	Out-Patient Department
HRH	Human Resources for Health
EHIS	Eye Health Information System
PHD	Provincial Health Department
CDMD	Cambodia Development Mission for Disability
ABC	Association of Blind in Cambodia
PEC	Primary Eye Care
HCS	Health Center Staff
RGC	Royal Government of Cambodia
RAAB	Rapid Assessment of Avoidable Blindness
AOP	Annual Operational Plan
CSMO	Cataract Surgical Monitoring Outcome
WPRO	Western Pacific Regional Office
MoH	Ministry of Health
PAD	Preah Ang Duong
KSFH	Khmer- Soviet Friendship Hospital
PEC	Primary Eye Care

Introduction

The new global action plan for the prevention of avoidable visual impairment 2014-2019 identifies the integration of eye health in the health system as priority. The integration is particularly important in regards to sharing existing resources effectively in low and middle income countries. This is most relevant at the primary and secondary levels, where resources for eye care are not enough, yet most eye problems are prevalent. The situation analysis and workshop focused on these two demographics where eye-care promotion is essential to prevent visual impairment.

Over the last decade interest has increased in understanding the relationship between the eye health system and the general health system. In Cambodia, 90.2% of all bilateral blindness is avoidable with 79.1% curable and 11.1% preventable through the provision of effective eye care services.

General consensus is also emerging in the international eye care community that the effectiveness of eye care interventions can only be improved through better understanding how health system function. A consortium of eye care experts and health experts, coordinated by the International Center for Eye Health (ICEH) at the London School of Hygiene and Tropical Medicine (LSHTM) have therefore developed the Eye Health System Assessment (EHSA) Approach[1, 2].

Objective

The objective of the assessment was to evaluate the eye care system in Cambodia in regards to the current level of primary health care. For the purpose of the present assessment, the EHSA was modified in order to focus on the current level of integration of primary eye care within the primary health care system in Cambodia.

The assessment was structured around the following six aspects of eye health:
(1) the governance
(2) financing
(3) service delivery
(4) human resources
(5) medicines, vaccines and equipment, and
(6) monitoring within the national information system.

The assessment identified strengths and weaknesses of the eye health system for each of the six aspects.

The Cambodia EHSA report was completed in 2013 through discussion between the National Program for Eye Health of the Ministry of Health, WHO, ICEH in Cambodia. Data collection

[1] EHSA guideline and country reports are available on http://www.healthsystemassessment.com/eye-health-system-assessment-ehsa-2/

[2] Blanchet, K., C. Gilbert and R. Lindfield (2012). Eye health systems assessment (EHSA): How to connect eye care with the general health system. London, International Centre for Eye Health, London School of Hygiene and Tropical Medicine.

was conducted through interviews with relevant eye health system stakeholders and document review and was assessed using the EHSA guideline developed by ICEH (Blanchet, Gilbert et al. 2012).This country report constitutes a basis for a national workshop to discuss the strengthening of the eye health system in Cambodia and to improve health outcomes for eye conditions.

The EHSA was carried out in 2013 by NPEH and WHO, and consisted of the following methods:

step 1: Group discussion - name a team leader and set up an assessment team. - arrange schedule of the assessment. - engage stakeholders related to the EHSA process
Step 2: Group Discussion - prepare field trip agenda - data collection checklist completion - contact with stakeholders
Step 3: Data collection - review protocol and probing questions - identify key information - interview with national, provincial, and district levels
Step 4: Data collection analysis and report writing - review collected data - identify strengths and weaknesses - summarized key findings - draft assessment reports

Date and Location of Assessment

Data collection was conducted from 26th of April to 20th of May 2013 in three different geographical areas: Phnum Penh City, Takeo province and Kompong Cham province.

In addition to the capital of Phnum Penh City, the two other provinces were selected by the cataract surgery performance results. Takeo province demonstrated good performance results in conducting the amount of surgeries outlined as a national target, ___ Province represent those with poor performance results by not performing the amount of surgeries outlined as a national target.. Moreover, the provinces were also selected based on the current level of primary eye care support, i.e. while Takeo province currently has a PEC programme with training, Kompong Cham does not. However, the choice of areas visited was not intended to be statistically representative for the whole country, but rather to provide insights of the strengths and weaknesses of eye health system in Cambodia.

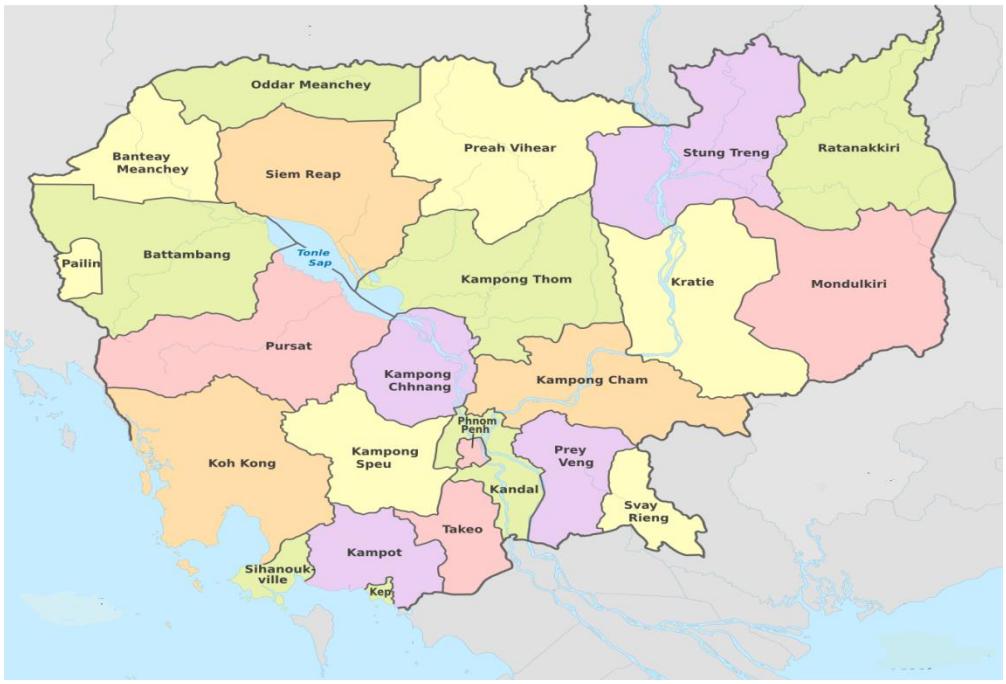


Figure 1: Map of Cambodia and its provinces

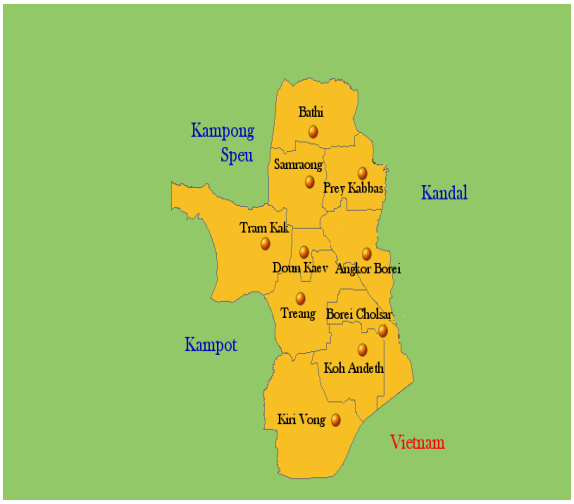


Figure 2: Map of Takeo Province

Figure 3: Map of Kampang Cham Province

Assessment Teams

There were six people in the assessment team, consist of National Program for Eye Health (NPEH) manager, coordinator as team leader, and three other staff of the NPEH. Technical support was also provided by a public health specialist from ICEH/LSHTM, Dr Karl Blanchet, and Technical Officer/Prevention of Blindness from WHO/WPRO, Dr Andreas Mueller. (Annex 2)

Interviews

The team interviewed 37 individuals (Annex 3) from national, provincial, and district level stakeholders or health authorities. The data collection at the national level was necessary to gather information on strategic planning of health service delivery, assessing an organization's relevance to eye health, and to provide an overview of the integration of eye health into the general health system in Cambodia. Provincial and District data collection was needed to understand the extent of eye health service delivery at facilities

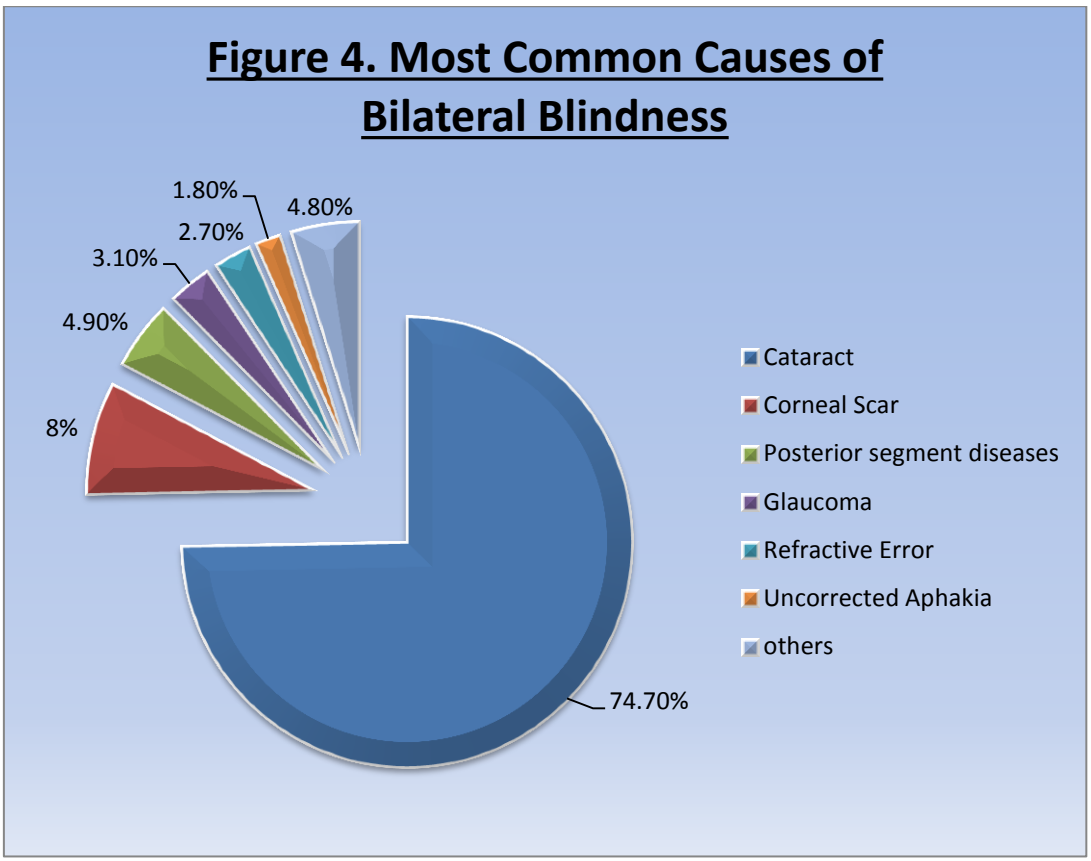
Prevalence of blindness in Cambodia

There is unequivocal evidence that blindness and blindness-related diseases have a negative impact on population health and the health system, in addition to being a socio-economic burden. According to Rapid Assessment of Avoidable Blindness Survey 2007 [RAAB 2007], there is an estimate of 43,800 people who are bilaterally blind in Cambodia, representing a prevalence of blindness of 0.38% of the population. Moreover, it was found that 333,591 people are living with visual impairment and 57,857 of them are severely visually impaired. The prevalence of blindness is higher amongst the female (3.4%) population aged 50 years and above compared to the male (2%) population of the same age.

Over the last 15 years, the Ministry of Health (MOH) invested greatly in the prevention and control of blindness through collaboration with relevant sectors. Additional health partners including local and international non-governmental organizations (NGOs) provided the technical and financial support. Although blindness prevalence was reduced from 1.2% in 1995 to an estimated 0.38% among general population in 2007, blindness remains a major public health issue in Cambodia.

Main causes of visual impairment and risk factors

The most common cause of bilateral blindness for people aged 50+ in Cambodia is cataract (74.7%), followed by corneal scars from all causes (8%), posterior segment diseases (4.9%), glaucoma (3.1%), refractive errors (2.7%), and uncorrected aphakia (1.8%). Other risk factors and diseases leading to blindness are eye injury, diabetic retinopathy and vitamin A deficiency [RAAB 2007], as demonstrated in the following graph.

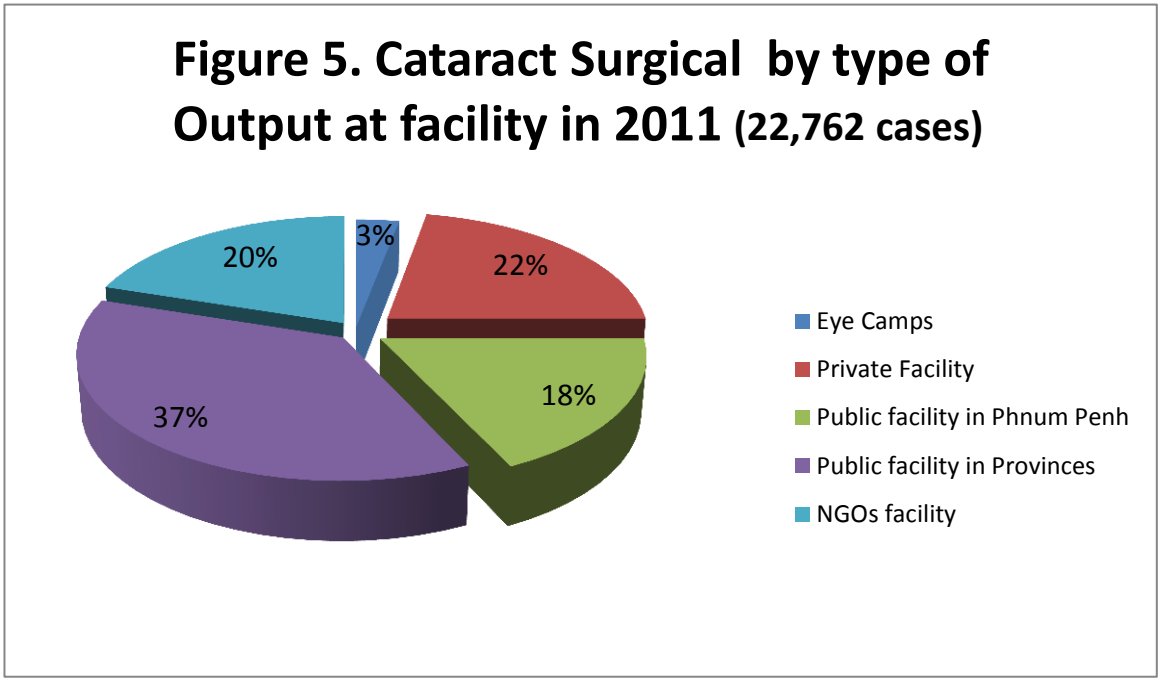


Source: RAAB 2007

The above graph revealed that 90.2% of all bilateral blindness is avoidable,79.1% is curable and 11.1% is preventable. [RAAB 2007]

The prevalence of bilateral blindness due to cataract is 1.9% of the population, which means that around 29,300 people in Cambodia are blind due to this disease in 2013. However, cataract surgery is recognized as one of the most-cost effective intervention.

The RAAB report recommended that elimination of blindness and severe visual impairment caused by cataract require a cataract surgical rate (CSR) of 3,000 per 1,000,000 people per year, however, the eye health system in Cambodia only achieved a CSR of 1,700 per 1,000,000 people per year (2012).



In Cambodia, 34% of blindness cases due to cataract, received cataract surgery (40% of males and 31% of females). Of all persons bilaterally blind due to cataract, 55% were operated in one or both eyes (67% of males and 50% of females). [RAAB 2007]

It was also found that the main barriers to access to cataract surgery were affordability (29%), fear of operation (13%) and lack of awareness (12%). (RAAB 2007)

National level

The National Program for Eye Health (NPEH) sits under the Director of Non Communicable Disease (NCD) at the MOH. NPEH collaborates with international donors to strengthen advocacy within the Ministry. NPEH is active in supporting the National Strategic Plan for Blindness Prevention and Control (2008-2015) with MOH and other partners. In addition, the national guideline for treatment of eye conditions (NPEH sources) in Cambodia was developed in collaboration with Cambodia Ophthalmological Society (COS), NPEH, and MOH. Regarding eye care resources, NPEH is involved in planning and budgeting the MOH strategic plan and to additionally mobilize financial resources in collaboration with international partners (e.g. the recent grant of 1 million USD fund from AusAid).

NPEH also participates to Joint MidYear Reviews (JMYR) of the Annual Operation Plan. The joint review progress of the Ministry of Health on the implementation of the sector, Annual Operational Plan (AOP) helps identify actual and potential strains to implementation.

Currently, the national eye care program implements the objectives stated in the National Strategic Plan of Blindness Prevention and Control 2008-2015. The National Strategic Development Plan Update 2009-2013 of the Royal Government of Cambodia (RGC) drives the national strategic plan for blindness control. Objective 3 in the Health Strategic Plan 2008-2015 of the MOH (See following table) specifically addresses the magnitude of endemic blindness in Cambodia.

Blindness Prevention and control-related HSP2 goal and objectives

HSP2. Goal3	Reduce the burden of non-communicable diseases and other health problems
Objective	1. To reduce risk behaviors leading to non-communicable diseases diabetes, cardiovascular diseases, cancer, mental illness, substance abuse, accidents and injuries, **eye health**, oral health, etc 2. To improve access to treatment and rehabilitation for NCD: diabetes, cardiovascular disease, cancer, mental illness, substance abuse, accidents and injuries, **eye health**, oral health, etc 3. To ensure Essential Public Health Functions: environmental health, food safety, disaster management and preparedness

There are 5 strategic areas for blindness prevention interventions mentioned in the strategic plan. Those priorities are eye health service delivery, eye health financing, human resources for eye health, eye health information system, and institutional development. During the eye health system assessment, most interviewees stated that the person's awareness of facilities increased particularly in regards to the government acknowledging the importance of eye health as the eye health is also included in the HSP2 program of the MOH.

Cambodia has 21 eye units throughout the country mostly located in provincial referral hospitals. Additionally, there are two regional eye hospitals (Takeo Regional Eye Hospital and Siemreap Regional Eye Hospital). In Phnom Penh specifically there are four eye units located in the following hospitals: Preah Ang Duong hospital, Khmer-Soviet Friendship hospital, Phnum Penh municipal hospital, and Calmet hospital. Each of those eye units are subsidized by the Fred Hollows Foundation. The rest of eye units located in provinces are subsidized by FHF, Eye Care Foundation, Iris, SEVA, Preah Ang Duong Eye department, Khmer-Soviet Friendship Hospital, and Takeo Regional Eye Hospital. These eye units serve as centers for training program (Ophthalmologist, Ophthalmic nurse, and refractionist) .

There are five blind schools located in the country with one each in Kompong Cham, Siem Reap, and Battambong and two in Phnom Penh city. Moreover, there are seven vision centers in Cambodia and six of these are funded by Avoidable Blindness Initiative (ABI). The seventh is supported by CBM. NPEH Vision2020 stated that vision centers are very important in the role of providing primary eye care. Services provided at these sites include: screening for eye diseases, refraction, dispensing of glasses and providing patient referral services.

Sub-national level

According to the MOH *Health Strategic Plan 2008-2015* the vision of "decentralization and deconcentration" states that the provincial health departments are responsible for the oversight of all health services in their areas, including eye care. However, eye care is not at the top of their agendas. During supervisions, NPEH usually discusses eye care problems with the local authority which may be a way of locally integrating eye care into the general health. Since eye units are located in the provincial referral hospitals, they are under the direction of hospital

management. In an attempt to mainstream eye care into general health care, it is reported that some of hospitals' outreach activities include eye care education.

Private sector services

There are many private eye clinics both in cities and provinces. In term of refraction, there are many private optical shops in Cambodia.

Donors or NGOs mapping and coordination

There are thirteen International Non-Governmental Organizations (INGOs) supporting eye health in Cambodia that provide services and training and often include subsidies, surgical supplies, and some medicines. INGOs also support NPEH in terms of human resources development (residency, ophthalmic nurse, refractionist, TOT, and primary eye care training) by providing scholarships and facilitating training activities. Moreover, infrastructure development and conducting research is also supported by INGOs.

Regarding rehabilitation, there are three DPOs (ABC, CDMD, KROUSAR THMEY) collaborating with INGOs that contribute to the referral system and delivering CBR activities.

Fred Hollows Foundation (FHF) in 2012 provided more than 2 million dollars to an eye care program. FHF is focused on the leading causes of blindness that include cataract, refractive error, glaucoma, corneal scarring and pterygium. They also work to strengthen the local health infrastructure, develop human resources, and improve access to, and affordability of eye health services for the population across eleven provinces and cities in Cambodia.

Eye Care Foundation provided around 210,000 USD to the eye care program in the form of disease control, basic surgical supplies, screening, eye drugs and consumables, PEC training and eye care promotion. In total, they support six provinces (Kratie, Steung Trerng, Ratanakiri, Mundulkiri, Svay Reang, and Thbong Khmum Kompong Cham).

SEVA foundation funded around 300,000 USD in three provinces (Battambong, Banteay Meanchey, and Siemreap).

Quarterly subsectoral meetings are organized between NGOs and NPEH to discuss the state of eye health care activities. Another meeting called Eye Care Forum gathers INGOs, NPEH, and representatives from MOH to discuss about eye care in the health system.

Governance of the eye health system

National level:

NPEH is responsible for overseeing and evaluating eye health services throughout the country. They have developed relationships with relevant directorates within the MOH such as Department of Planning and Health Information System, (DHRH), and Department of Preventive Medicine. Moreover, the NPEH manager established good collaborative relationships with the Secretary of State of MOH who is very committed to eye care.

In 2013, AusAID granted 1 million USD for an eye health program to strengthen the strong commitment and advocacy of the NPEH. The latter also mobilized INGO funds to support and increase eye health services on infrastructure, human resources, disease control, and research development.

Funded by FHF, the Siem Reap Regional Eye Hospital (SRREH) was inaugurated in 2011 at a cost of 462,556 USD. Moreover, the Kompong Speu Eye Unit was constructed in year 2011 at a cost of 370,992USD, funded by FHF and the Australian government. Ultimately the work of NPEH is crucial at seeking financial support for eye health performance in Cambodia.

Provincial level (secondary eye care)

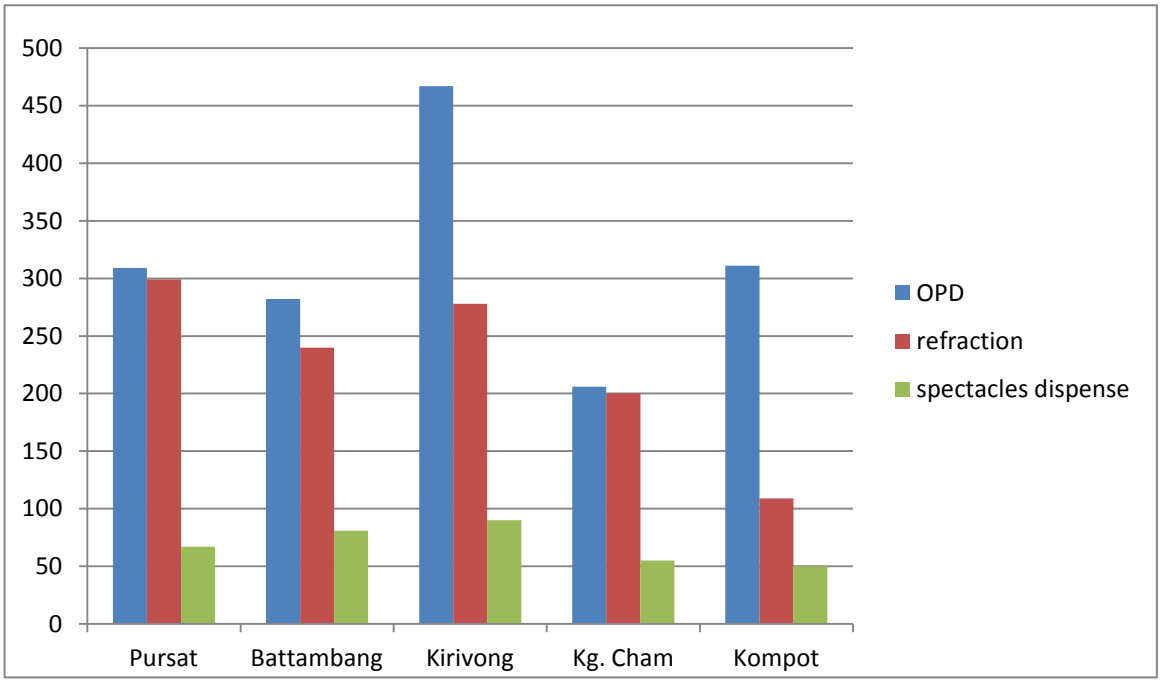
Most eye units in Cambodia are located in provincial referral hospitals. There is only one eye unit located in a district referral hospital (Tbong Khmum in Kompong Cham Province). However, Takeo Eye Hospital (TEH) is located offsite from provincial referral hospital. Its location is provided by provincial health department (water and electricity are included). All other eye units are located in provincial referral hospitals are under their management.

Supervision and evaluation are still conducted by NPEH with additional reports on their activities (number of patients OPD, IPD, Surgery, Screening, and Training) submitted quarterly to both INGOs and NPEH. Provincial health departments provide building and recurrent supplies such as water, electricity, beds, some essential medicines, and cover staff's salary. However, outreach activities (fuel, staff incentive, and other supplies) are not funded by the hospitals but by INGOs.

Community eye care level

Primary eye care is delivered by vision centers in six provinces. They have ophthalmic nurses and refractionists. Beside this, all provinces throughout the country have health center staffs, community health nurses, and villager volunteers who were trained about the basic eye conditions like conjunctivitis and the referral system. Vision centers are effective in providing not only PEC but also refraction. It can be noticed that the number of people accessing eye services at vision centers increased sharply.

Figure 6: Activities of the vision center in Provinces in 2012 (Source NPEH)



Primary eye care facility

PEC is delivered by health center staff, villager volunteers, and community health staff who were trained about the basic eye conditions such as conjunctivitis, eye health education, and referral conditions. Furthermore, there were 2,271 Primary Eye Care Workers in 2011 who were trained in the same curriculum and length of time.

However, it has been reported that there has never been any supervision or evaluation from district or provincial eye health authority at all. In addition, since they received training, there has never been any refresher course organized for the PEC staff.

Interviewees also emphasized that they sometimes refer patients to nearby eye units for medical or surgical intervention when they are not overloaded with other activities (birth delivery, vaccination, or minor surgery etc.). An interviewee said that for the two years since he has been trained for the PEC, he has referred less than ten cases of eye problems to eye units. This data only demonstrates that eye care is not the priority for them.

Disabled People's Organizations

In term of disabled people's organizations, Cambodia has three organizations that are usually involved in Community-based-Rehabilitation (CBR).
Association of the Blind in Cambodia (ABC) is located in nine provinces throughout the country (Siemreap, Battambong, Prey Veng, Kompong Thum, Kompong Cham, Kratie, Kompot, Kompong Speu, Pursat, and Banteay Meanchey). ABC is working on behalf of blind people to advocate to the public, as well as to the government, their voices and status in society. Its project includes vocational training (e.g. massage training, computer training, and a doormat knitting course); advocacy (a library which has materials about blindness); a newsletter for all blind people to have a voice and inform the public about their ideas and achievements; education (Braille library class, Krousar Thmey's blind schools and public

school inclusive classes); and rehabilitation. The rehabilitation program is focused on assessment and research of blindness, orientation mobility/ daily living skills, identifying patients with eye problems, referral to eye units and schools, primary eye health care training activities to community, and primary school screening. They collaborated well with local authorities and local NGOs (FHF/IRIS, Eye Care Foundation, Krousara Thmey, Brian Holden Institute, and CBM). ABC reported that even though they have not signed any MoU with any Ministry, they have the opportunity to advocate to the government or NPEH during eye care forum and subsector meeting that is usually held every two months.

Cambodian Development Mission for Disability (CDMD) is another DPO that has also implemented a CBR program. They are working well with CBM via Takeo Eye Hospital to advocate for disabled persons across five areas (PP, Kandal, Takeo, Kompot, kompong Speu). CDMD has an MOU with the Ministry of Social Affairs (MoSVY). They have 32 members in five provinces that provide eye health education to the community, screen eye health problems and refer them to eye units for intervention, and rehabilitate blind people. They have reported that there is a lack of transfer of blind people from eye units to rehabilitation services. CDMD also stated that blind people should be involved into the development of the NPEH strategic.

Key Findings

Strengths

- NPEH has good relationships with many departments at MOH including the Secretary of State.
- NPEH has the capacity and ability to mobilize funds from donors.
- Eye care is included in the Cambodia minimum package of care that includes management of refractive error, trachoma and cataract.
- Active DPOs (ABC, CDMD, Krousar Thmey) work in CBR in a number of provinces.
- Health sector regulations are applied to eye health.
- TEH collects information on patient's satisfaction and cataract surgical outcome.
- The RAAB survey was conducted in 2007 and generated strong evidence on blindness in Cambodia.
- NPEH has a good relationship with donors and represent a key actor for coordination between eye care providers in the country.
- A strong national strategic plan for blindness prevention in line with government and health strategic plan has been developed.
- Infrastructure capacity development has significantly increased over the last 10 years.

Weaknesses

- There is limited opportunity for DPOs to have a voice or be involved in eye care service planning or budgeting.
- There is no feedback mechanism from service users about quality and cost of eye care services provided.
- Eye units are only delivered in provincial referral hospitals (only one eye unit is in Tbong Khmum district referral hospital).

- At the provincial level, eye care is not the priority concern.
- There is a lack of evaluation on PEC training practices, including lack of supervision of trained staff and lack of refresher course.

Eye Health financing

Revenue collection: amount and sources of financial resources

As an attachment to the health sector strategic plan 2008-2015, the strategic framework for health financing 2008-2015 of MOH states that "by 2015 the different elements and institutions of the current health financing system will be combined under a single strategy guided by national health priorities; social health insurance mechanisms will be in place; the poor will be protected by suitable social transfer mechanisms; government funding for health will be at an appropriate level for the adequate provision of services to the population; donor support will be harmonized and aligned with national priorities and support effective service delivery".

MOH did not have budget information on how much has been spent on eye care. NPEH mentioned that the current level of funding is estimated to be far below an appropriate level of funds required for supporting eye health service delivery to meet the eye health needs of the population(there is no specific data of the appropriate level). Eye care is under the budget line of non-communicable diseases (NCD) which accounts for 15% of total health expenditure.

In 2012, NPEH gained around 6,380 USD from government to run NPEH's office while the total amount of budget required was 22,477 USD in 2011. The rest of the budget was covered by INGOs.

The total budget provided by the partner NGOs in Cambodia in 2012 was around over 3,000,000 USD. Data on the national budget for eye health was not available. However, the current funding is estimated by interviewees to be far below the appropriate level of funds required for supporting eye health service delivery in the population.

The activities of the NPEH office have been partially supported by the government and partially by INGOs to cover administration costs, office supplies, communications, monitoring, supervision, and stipend for the national NPEH coordinator, assistant coordinator and two secretaries. The funds covered by donors (FHF, CBM, Eye Care Foundation, Seva, ICEE) go directly to the facilities under the coordination of NPEH.

Prevention of blindness and control-related HSP2 goals and objectives are clearly defined as presented in box below. Reducing blindness rate is one of the impact indicators that are included in the HSP2 monitoring and evaluation framework.

Blindness Prevention and control-related HSP2 goal and objective

HSP2. Goal3	Reduce the burden of non-communicable diseases and other health problems
Objective	4. To reduce risk behaviors leading to non-communicable diseases diabetes, cardiovascular diseases, cancer, mental illness, substance abuse, accidents and injuries, **eye health**, oral health, etc 5. To improve access to treatment and rehabilitation for NCD: diabetes, cardiovascular disease, cancer, mental illness, substance abuse, accidents and injuries, **eye health**, oral health, etc 6. To ensure Essential Public Health Functions: environmental health, food safety, disaster management and preparedess

Eye health services are integrated into (1) the minimum package of activities (MPA) at Health Center (HC) level and (2) the Complementary Packages of Activity (CPA) at Referral Hospital level. Therefore, poor patients with eye diseases and eye-related problems can benefit from Health Equity Funds (HEFs) - a pro-poor demand side financing mechanism to remove financial barriers to get to access public health services, currently funded by the Royal Government of Cambodia (RGC) and health partners. The benefit packages of HEFs include all services that are defined in MPA and CPA. (annex 11)

There are national, provincial and district referral hospitals, classified at three levels based on number of staff, beds, medicines, equipment and clinical activities.

-CPA-1: No large-scale surgery (no general anaesthesia) no blood bank or blood deposit, has a basic obstetric service. There were 33 hospitals at this level in 2011.

-CPA-2: CPA-1 plus emergency care services and large-scale surgery (with general anaesthesia), including ICU, and other specialized services such blood transfusion, Ear, Nose, Throat (ENT), Ophthalmology and orthodontics services. There were 31 hospitals at this level in 2011.

-CPA-3: CPA-2 plus large-scale surgery (with general anaesthesia) and more activities (in terms of both numbers of patients and activities) with various specialized services. There were 26 hospitals at this level in 2011.

According to interviewees at national level, the budget setting for eye care is done in two ways:

-Bottom-up: NPEH is responsible for developing strategies done through the collection and collation of annual operational plans (AOP) that are then transmitted to MOH for consideration.

-Top- down: MOH decides whether which activities of the AOP of NPEH are financed.

NPEH stated that they have to prepare an annual plan specifically in order to ensure that there is no gap or imbalance between input, output, and outcome. They then submit a budget

proposal to the government/MOH. In 2012, the total budget submitted by NPEH was 82,000,000 Riels (200,000 USD) but the government only provided 6,380 USD.

NPEH reported that more than 3 million USD come from donors (FHF, ECF, Seva Foundation, ICEE, CBM/Caritas, Iris Foundation). Recently, in 2013, AusAID granted 1 million AUD to the eye health program. However, this fund is given to NPEH via MoH.

Public information and feedback about eye care services

Two thirds of eye units in Cambodia prominently display a service list providing some information about service fee such as registration fee, diagnostic test fee (A scan, B scan…), and type of surgical fee. (Annex 7, 7.1, 7.2)

The information about user fee exemption or quality of services is not publicly available in facilities. Interviewees stated that the lack of exemption fee and quality of information is a barrier for poor people who seek eye care services (poor people don't know whether they are allowed to get access to free or exempted eye care services). This is a potential opportunity for NPEH to advocate for further solutions to ensure that people become aware of eye care services provided.

Sources of funding for eye health service delivery

All government eye facilities are located in referral hospitals. NGOs funds are generally provided to facilities via NPEH:

- Government funds cover staff's salaries, and general recurrent costs (water, electricity, beds), and some essential medicines.
- Donors' funds cover drugs, consumables, outreach activities, and subsidies.

For example, TEH is funded by CBM and the government with the land, water, electricity, staff's salaries, and some essential medicines are provided by government via the Provincial Health Department and consumables, drugs, outreach activities, subsidies, and buildings are funded by CBM. In addition, ABC also provides case-payment for cataract and pterygium.

Kompong Cham eye unit is partially funded by IRIS foundation to provide outreach activities, PEC training, consumables, drugs, and subsidies. On the other hand, salaries, water, electricity, eye unit's building and some drugs are the responsibility of government.

Budget Setting and Expenditure at Facilities

Theoretically, eye units submit their budget plans to the hospital, and then the hospital will submit the plan to the Provincial Health Department.

For NGOs-supported government facilities, such as TEH, the money from cost-recovery mechanism such as fees from registration, glasses, medicines are used to run facilities. Interviewees at TEH stated that they always submit the budget directly to CBM and funds are directly allocated to them to run the services.

In contrast, Kompong Cham eye unit is not directly supported by NGOs with registration

done at the hospital, and drugs managed by the pharmacist . This collaboration allows the NGO to be better integrated into the hospital.

Health insurance scheme

Currently, there is a national health insurance scheme operating in the country called Community-Based Health Insurance (CBHI). It was introduced in various parts of the country by a range of international and local NGOs. CBHI refers to voluntary health insurance scheme organized at the community level. It covers user fees for access to primary healthcare through contracted public health centers and transportation costs to hospital. However, the eye care services are not included in this type of insurance scheme. This caveat provides an opportunity for NPEH to be involved in discussions about what services should be covered.

User Fees in Health Financing

People can access eye care services through eye camps, eye screening, nearby health centers (PEC), and referral hospitals. User fee refers to decentralized and affordable user charges at public health facilities, as stipulated in the Cambodian Health Financing Charter 1916. The charter certifies the imposition of official fees according to an agreed schedule at affordable rates following consultation with the community. Public hospitals and health centers are allowed to implement this scheme after approval from MOH; however, prices for eye care services are not standardized allowing for a variation in service fee between regions,

Comparison of User Fees for Eye Health Service in 3 Regions in Cambodia

Service	Regions		
	ADH Fees (Riel)	THE Fees (Riel)	Kg. Cham Fees (Riel)
1. Registration	7,000	4,000	6,000
2. Phaco + IOLs	1,200,000	2,000,000	Not available
3. ECCE + IOLs	400,000	600,000	320,000
4. ECCE	250,000	400,000	250,000
5. Trabeculectomy	250,000	400,000	200,000
6. Pterygium Excision	300,000	80,000	120,000
7. Lid Surgery	150,000	120,000	120,000

Every eye unit in Cambodia has a cost-recovery system. Cost-recovery systems include registration fee, service fees, glasses shop, and medications. For example: TEH has four beds reserved to full fee paying patients and at the optical shop 48.8% of customers paid the full price for their glasses (2-6 USD) and registration fee (4000Riels---1$). Since eye care is incorporated into general health facilities, the price of services is established by hospital managers. Normally, user fee for consultation ranges from 4000Riels to 12000Riels (1-3 USD) depending on regions. The price of inpatient care not requiring surgical intervention (e.g. treatment of corneal ulcers) varies between 60000Riels to 100000Riels for the whole

medical treatment. On the contrary, surgical cases are not charged per bed. After surgery, patients can stay in hospital without paying for the bed. If a patient falls below the poverty line, essential medicines are used. However sometimes the patients prefer to buy market medicines (the medicines that are not available in NEML of MoH) such as vigamox, predfort, and tobradex etc.

Recently the government instituted a protocol to cover fees of the poor (those under the national poverty line). In Cambodia, the coverage of RGC subsidies is found within 6 national hospitals, 10 referral hospitals, and 89 health centers. Aside from government subsidies, user fee exemption is also provided to patients who are unable to pay. The coverage of this scheme is nationwide. Interviewees reported that around 40% of patients in eye care are exempted. User fee is a large obstacle to access for poor patients mostly for those who live in rural areas.

Revenues collected from user fees are managed locally by a collecting facility in accordance with the Ministry of Economy and Finance and MOH inter-ministerial Prakas, These rules state that 60% of the total fee income is used for staff incentives,while the other 39% for operating costs and the remaining 1% is transferred to the national treasury.

Key Findings

Strengths

- The National Eye Health Budget is integrated into CPA and MPA (basic benefit package) budgets of MOH.
- The Health Equity Fund can reduce the financial barrier to eye care services.
- NGOs always provide funds for outreach activities in remote areas, which has the positive impact on cataract surgical rate (CSR).
- The eye health system is highly supported by international donors and NGOs.

Weakness

- User fees are not standardized.
- Most of government eye units are separated from the rest of the hospital as funding for consumables and drugs comes directly from NGOs.
- Budget for eye care from MOH is far below the appropriate level of funds required for supporting eye health service delivery to meet eye health needs of the population.
- Eye care heavily depends on NGOs funding that may really affect the long-term sustainability.
- The majority of eye care program is funded by INGOs.
- Cost is the main barrier for accessing cataract surgical services.

Eye Health Service Delivery

Availability, access, coverage and utilization of eye care services

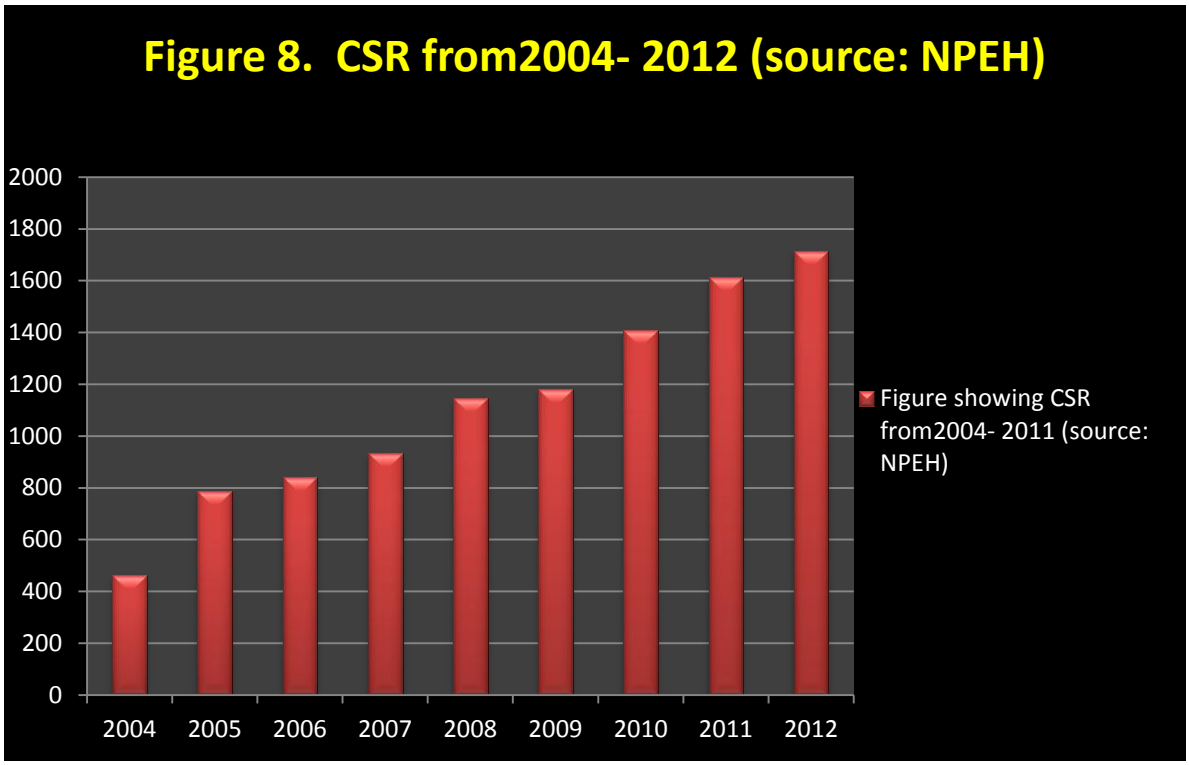
There is evidence that blindness and blindness-related diseases have a negative impact on population health and health system, as well as the socio-economic situation of populations.

Main cause of avoidable visual impairment areage-related factors, ie the elderly are more at risk. The population aged 50+ in Cambodia is expected to reach 2,700,000 (16% of the total population) by 2020 according to the National Institute of Statistics, Ministry of Planning of Cambodia population census in 2008.

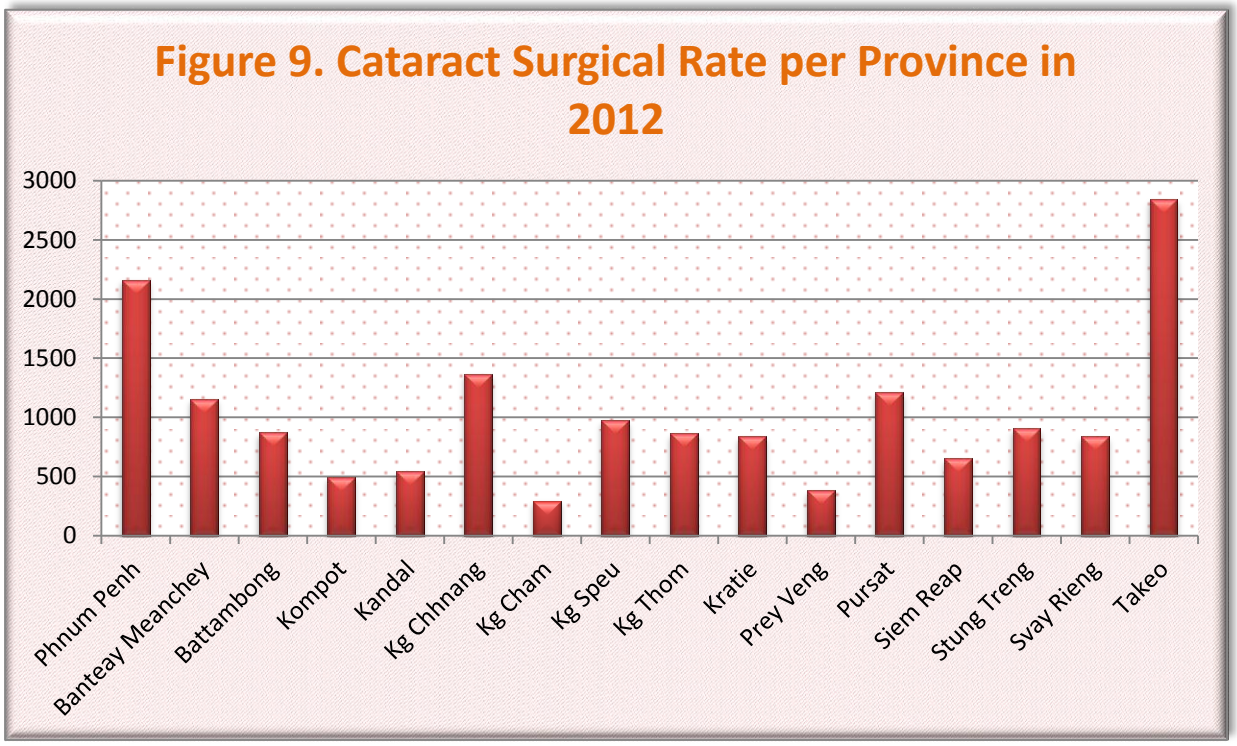
The MOH has made great efforts to locally prevent and control blindness in collaboration with relevant sectors and significant technical and financial support from health partners including local and international NGOs. Although blindness prevalence has been reduced among the general population from 1.2% in 1995 to an estimated 0.38% in 2007, the prevalence of blindness in people aged 50+ is estimated at 2.8%.

The RAAB report in 2007 reveals that elimination of blindness and severe visual impairment caused by cataract required a cataract surgical rate (CSR) of 3,000 per million populations per year, while the current performance of the eye health system is only 1,700 per million populations per year. This result highlights that service delivery is underperforming.

Performance tends to vary by province. TEH has a population of 843,931with a cataract surgery target is 2,500. They almost reached their target with 2,400 people operated for cataract in 2011 and 2,292 people operated in 2012. On the other hand, Kompong Cham has a large population of 1,680,694 while only 148 cataract surgeries were performed in 2011 and 158 in 2012. Kompong Cham’sannual cataract sugery target is 4,500.

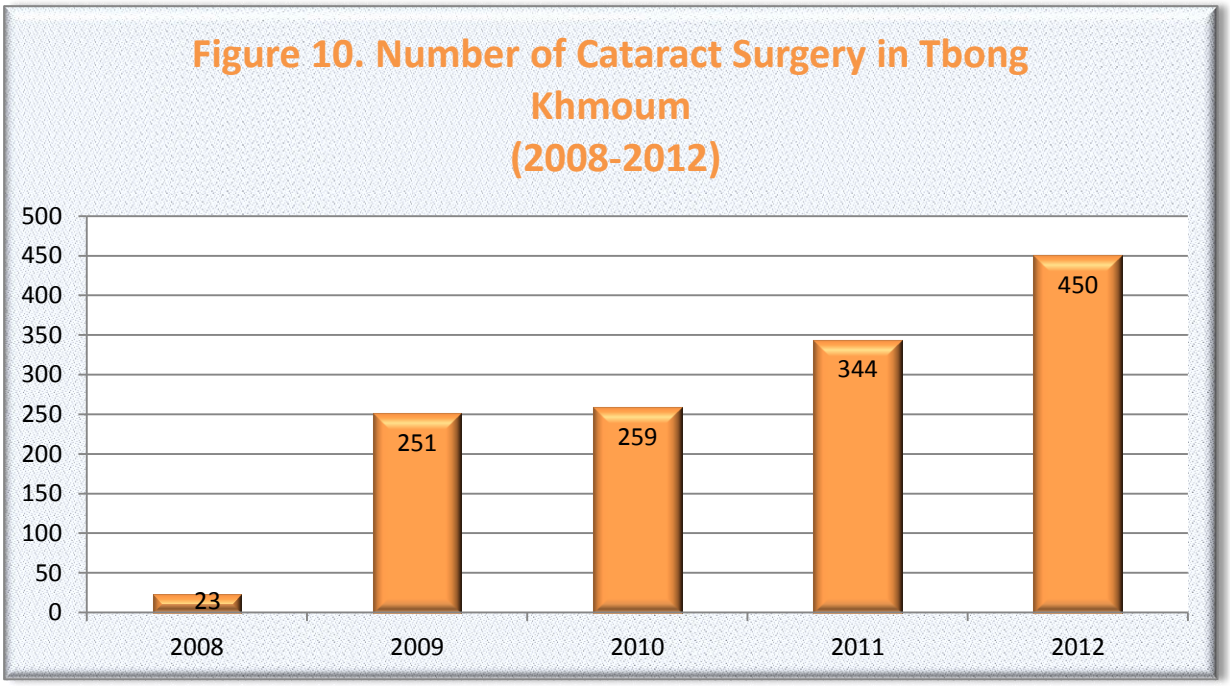


National Program for Eye health Data



- Interviewees reported that most people in rural areas were generally afraid of surgery, and consulted a nurse at a very late stage. Moreover, the Cambodians generally don't believe blindness is a result of disease.
- One interviewee at at Tbong Khmum district referral hospital stated that "cataract or blindness is caused by a person having done something wrong in his/her past life and receiving punishment in this life; simply inherited in the family and passed down from

generation to generation" . This may have an impact on patients' need to access to eye care services. In addition to the belief and fear issues, cost is a significant barrier for poor people to seek for cataract surgery. For example in Tbongkhmum eye unit Kompong Cham province reported that their cataract surgical number increased as soon as ABC subsidized cataract surgeries 2012.



Regarding refractive errors, the RAAB 2007 reported that refractive errors accounted for 20% of blindness and visual impairment amongst population aged 50 and over and 10% amongst children. A cost-effective intervention for correcting refractive errors is the use of spectacles. The NPEH report stated that there are 6,000 pairs of glasses that are donated by eye units, local NGOs and visiting teams every year to people with refractive errors and low vision,. There is an estimated need for 600,000 pairs of spectacles to be distributed every year based on the NPEH report. Increasing public awareness of refractive errors through Information Education and Community (IEC) strategy can significantly contribute to preventing and reducing blindness.

There is a huge gap between availability of eye health services and total number of RHs and HCs in Cambodia. Eye health services are available in only 21 RHs out of the 80 provincial and district-based RHs, and in around 70% of HCs out of the total number of 997 HCs.

PEC workers refer to health center staffs, villager volunteers, community nurses, and community health officers, trained about basic eye conditions such as conjunctivitis. They also conduct community eye health education and refer patients to health units. Although the network of PEC theoretically provides a good referral system, in practice, the referral rate is generally poor. Some interviewees reported that there are more than 2,000 primary eye care facilitators trained in the country but only 5% of them occasionally refer patients to eye units for treatment.

There are several reasons that could attribute to this including:

- There is no commitment from those who were trained.
- There is no refresher course for them so that they may not have any ideas to refer nor treat patients “time passed, they forgot what had been trained".
- There is no financial incentive.

PEC facilitators also reported that there is a lack of equipment such as E-chart, Pinhole, or torch in their facilities. Beside health center staff and community nurse, DPOs (e.g. ABC, CDMD, KROUSAR THMEY) are also involved in PEC and CBR activities. For example, TEH reported that they have a strong referral system where patients may require further rehabilitation services. Patients are referred to TEH's partners such as CDMD which has a strong presence in Takeo especially within its remote areas with a strong network of volunteer health workers and self-help groups. There were 139 patients referred to CDMD for rehabilitation and 1,423 patients were referred from CDMD to TEH. In addition, Takeo province has a vision center in Kirivong district at Kirivong referral hospital vision center. There are two ophthalmic nurses who are generally in place 7 days per week to provide services such as consultation in primary eye care, refraction errors, optical shop, promotion and eye health education, eye screening and referral system. It is also reported that Kirivong Vision Centre is well integrated with the district referral hospital (registration at KRRH> clinic VC> cashier> pharmacy).

The majority of eye health services are provided by ophthalmologists located in eye units in provincial referral hospitals, although the number is unevenly distributed throughout the whole country. There are still a few eye units not functioning well; both Preah Vihear and Ouddor Meanchey eye units only have ophthalmic nurses who were trained in refraction. Due to the lack of ophthalmologist on these units, the services provided are limited. A basic eye doctor along with three ophthalmic nurses are responsible for eye care intervention in Neak Leung eye unit but the outputof service delivery is still a concern.

Outreach

Even if there is eye care provision in facilities, populations living in remote areas can only benefit from outreach services. The activities of outreach services are generally funded by NGOs (FHF, Eye Care Foundation, Iris etc.). Outreach services provided include:

- Cataract surgery
- Pterygium excision
- Lid surgery
- Glaucoma surgery

Eye care outreach is often done on an ad hoc basis when funds are available. NGOs reported that they usually provide outreach services to remote areas twice a year. In addition, two weeks after surgery, eye care personnel go on follow up to operated patients in order to make sure that there are in good conditions. However, TEH usually provides hospital-based services (surgery) to patients. They travel to provide screening for the

community and take those in need of surgery back to the hospital. On the other hand, Kompong Cham eye unit provides both hospital-based and population-based services. They reported that they have had international outreach teams from Vietnam perform surgeries in their catchment area without informing NPEH or provincial/ district health department. NPEH report showed that outreach eye camps accounted for 4% of total OPD patients and performed consecutively 2,146 cataract surgeries in 2012.

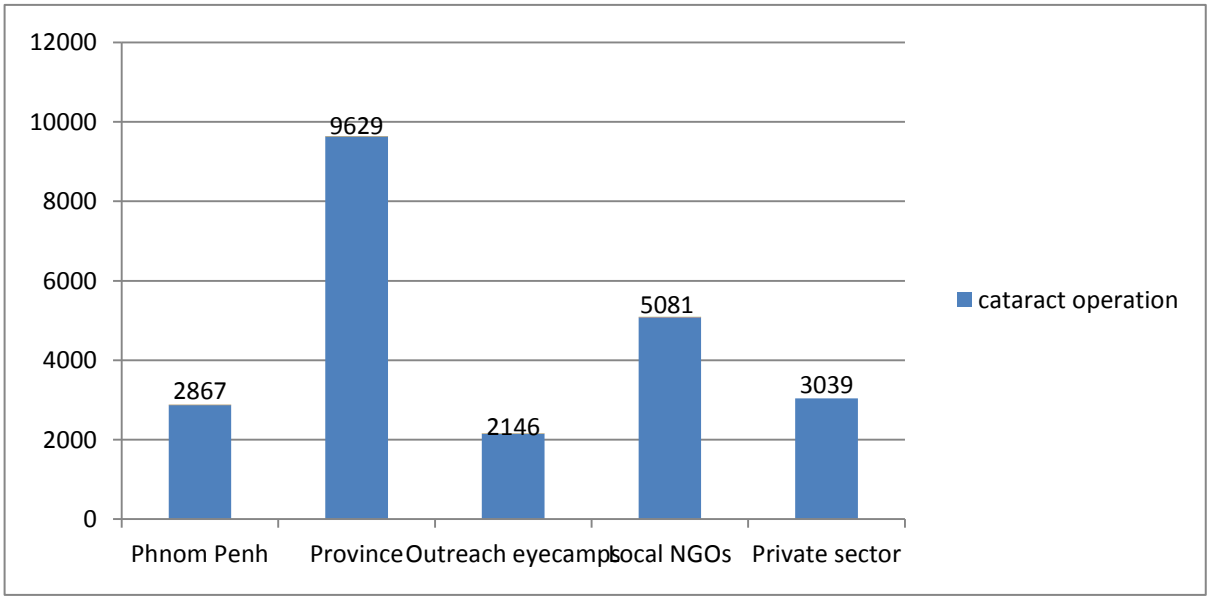
The criteria of accessibility and number of population covered in MPA (HCs) and CPA (RHs) is defined as in Table 1 (page 67).Interviewees at facility level reported that most people who come to receive eye care services reside within a 40-km radius from facilities. Below is the report of TEH's consultation patients categorized by original location in 2011 (Table 2)(page 68)

Accessibility of Eye Care Services

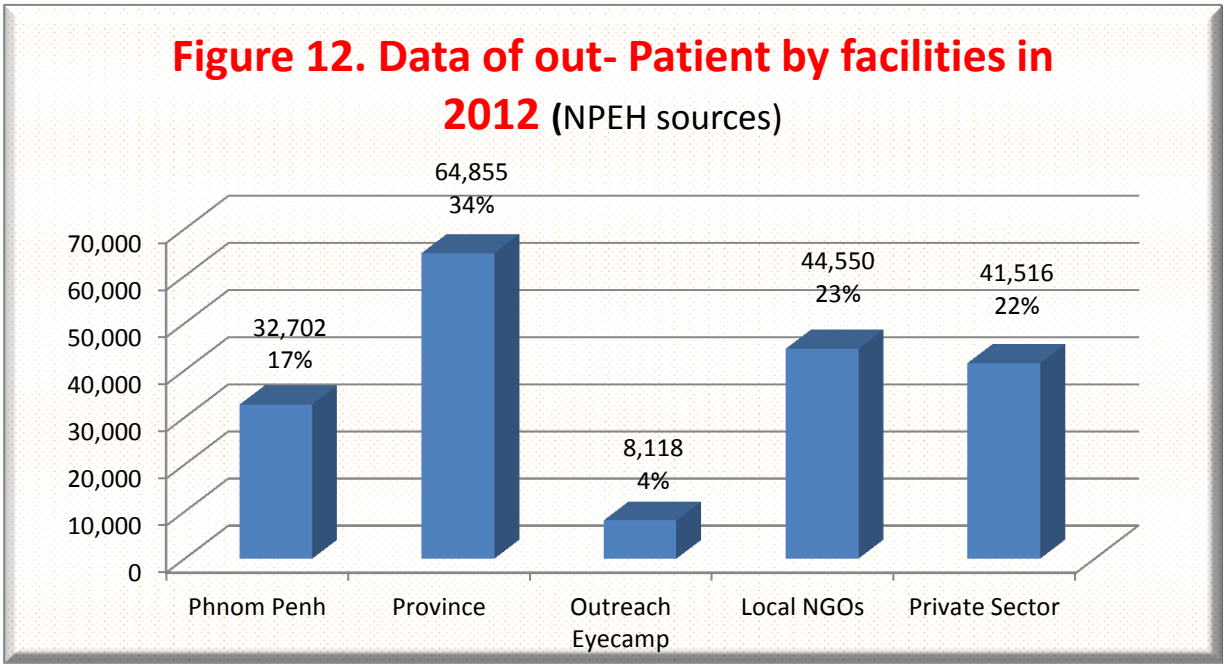
There is no assessment of the price of a consultation or a cataract surgery operation compared with the living standard. However, MOH has extended its support to eye care services by providing Health Equity Funds to 20 USD for any poor inpatients in a number of hospitals in Phnum Penh and in many provinces with unlimited number. Even though the amount does not fully cover the costs, it still takes part in reducing the financial barrier for eye care service. NPEH reported that around 40% of patients are exempted from user fees. At TEH patients 35% are exempt while Kompong Cham eye unit are 60% exempt. Exemption is applied to poor patients who have a pro-poor card issued by local authority where it is known that their living standard is really low; and for poor people who don't have any card, they need to get an interview with hospital staff before being qualified for exemption.

In addition, services are delivered for free for monks and vulnerable people (e.g. people with disabilities). Interviewees reported that the strategy to improve access to eye care has increased during the last 5 years.

Figure 11: Data of Cataract surgical by facilities in 2012(NPEH sources)



The role of the private sector in eye care system is to provide service delivery to patients who can afford user fees. NPEH reported that in 2012, 3,039 cataract surgeries were conducted by the private sector accounting for 11% of the total cataract surgeries performed.



There is no support from government for private sector activities. In order to get a license to run services, private sector providers have to register at MOH. The license lasts only 3 years after which they have to renew it.

Integration of Eye Care with other Health Services

The integration of eye care into the general health varies between regions. For example, in Kirivong district hospital, interviewees reported that eye health education is integrated within other outreach activities such as vaccination, maternal child health, sanitation and hygiene, and micronutrient supplementation. Kirivong Vision Center referred 252 to TEH (cataracts 190 and other 62) during the first quarter of 2013. Kirivong Vision Center is usually visited every two months by the TEH team and district health department for oversight.

Kompong Cham eye unit reported that the trained health center staffs and village health volunteers are responsible for the provision of basic eye care services, identification and referral of complicated cases. The network of PHC employees staff were trained in basic eye care andshould theoretically provide a good referral system, however, in practice the referral rate is generally poor.

It was reported that health workers from other programs (i.e. HIV, Diabetes, and TB) were never trained on eye health . As a result, there is a lack of communication to transfer patients in time so that they can receive appropriate treatment.

Quality Assurance

Every month in TEH they conduct surveys on patients' satisfaction (Annex 8, 9). The questions are given to around 50 patients, both in In-Patient Department (IPD) and Out-Patient Department (OPD). The purpose of doing this survey is to assess the practice of staff and how the patient perceive their services. This information is forwarded to the national level.

TEH is the only hospital collecting data every year on cataract surgical outcome (Annex 10, 10.1,10.2,10.3,10.4). This data is always sent to NPEH and it conducted a workshop about cataract surgical outcome monitoring (CSOM) in December 2010. The objective of this workshop was to encourage the participants to measure and tabulate the visual outcome of cataract surgery. Unfortunately, based on the feedback following the workshop, only TEH implemented the policy. In addition, there are limited opportunities for DPOs to be involved in the planning for eye health services with no consultation process at local or national levels regarding the priorities of services. There is also limited patient feedback.

The monitoring and evaluation of quality of eye care services provided by eye care workforces is done by NPEH at least twice a year. However, supervision by NPEH was not done regularly due to a shortage of fund. NPEH stated that the purpose of doing supervision is to strengthen the quality of services and evaluate technical or clinical of eye care personnel however, there is no supervision guideline. Interviewees in facilities reported that there has never been any supervision from district or provincial to their facilities. NPEH collaborated with Cambodia Ophthalmological Society (COS) with senior professors who have participated in residency training program to develop the National Treatment Guideline 2012 issued by MOH for all ophthalmologists/ BEDs to standardize the quality of eye care services throughout the country.

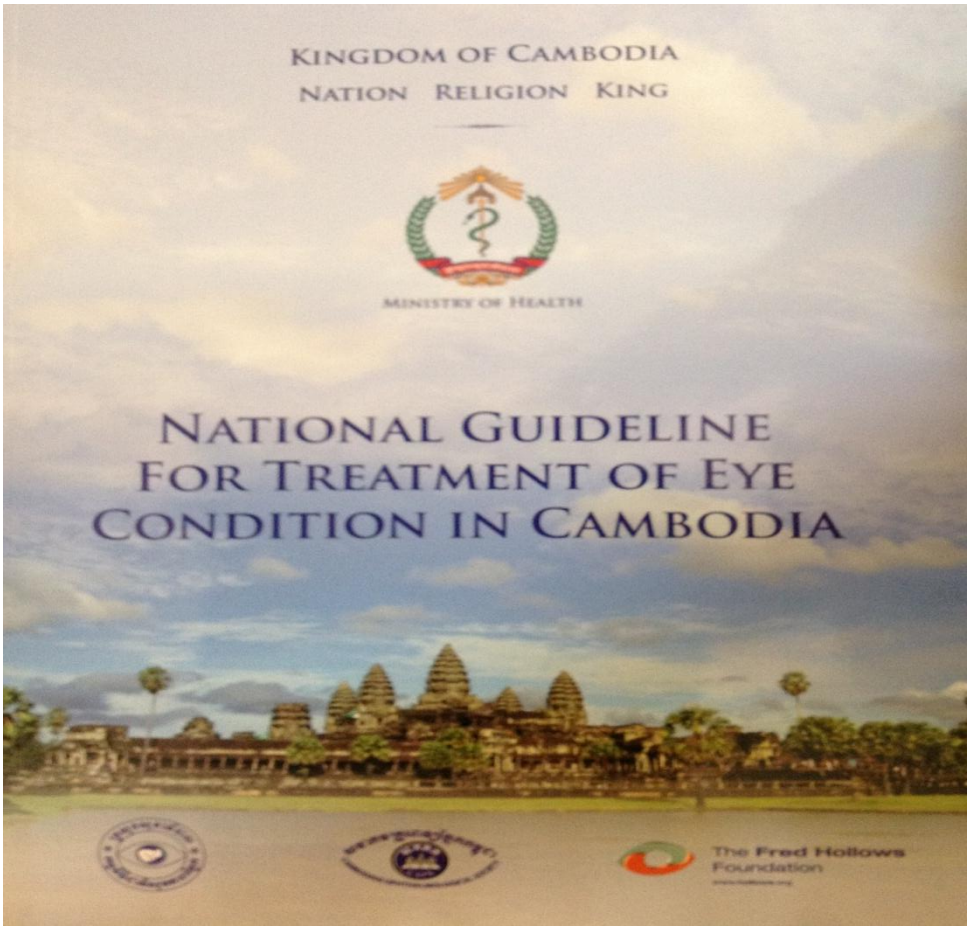


Figure13: National Treatment Guideline

Key findings

Strengths

- There is a national treatment guideline regarding the eye health system to improve the standardized quality of services delivered.
- The number of people accessing eye care services nationally has markedly increased by reducing financial barriers thanks to Health Equity Fund and subsidies.
- Outreach services are effective and available to contribute to clear the cataract backlog at remote areas.
- Eye care services are included in the essential services of the HSP2 framework.
- There is an integration of PEC into PHC network through the training of health care workers or community nurses about some basic eye conditions and referral system. Eye health education is integrated with other outreach activities such as vaccination, maternal child health, sanitation and hygiene, and micronutrient supplementation

Weaknesses

- The CSR is too low to deal with the incidence and prevalence of blindness due to cataract.
- Outreach services are almost exclusively done by NGOs exemplifying that most of the service delivery heavily depends on external funding, which threatens the long term sustainability of eye care.

- There is a lack of clinical supervision on PEC and supervision activity.
- The referral system is poor.
- There is no standardized quality measurement of eye care service delivery throughout the country.
- There is a lack of communication between eye care service providers and authority.
- There is a lack of equipment for eye care at primary level.
- There is a lack of eye care service at Referral Hospitals.
- There is a lack of services at the primary as well as district level.
- There is a lack of low vision or visual rehabilitation services

Human Resources for Eye Health

Different Cadres of Eye Care Staff in Cambodia

Cambodia trains different cadres

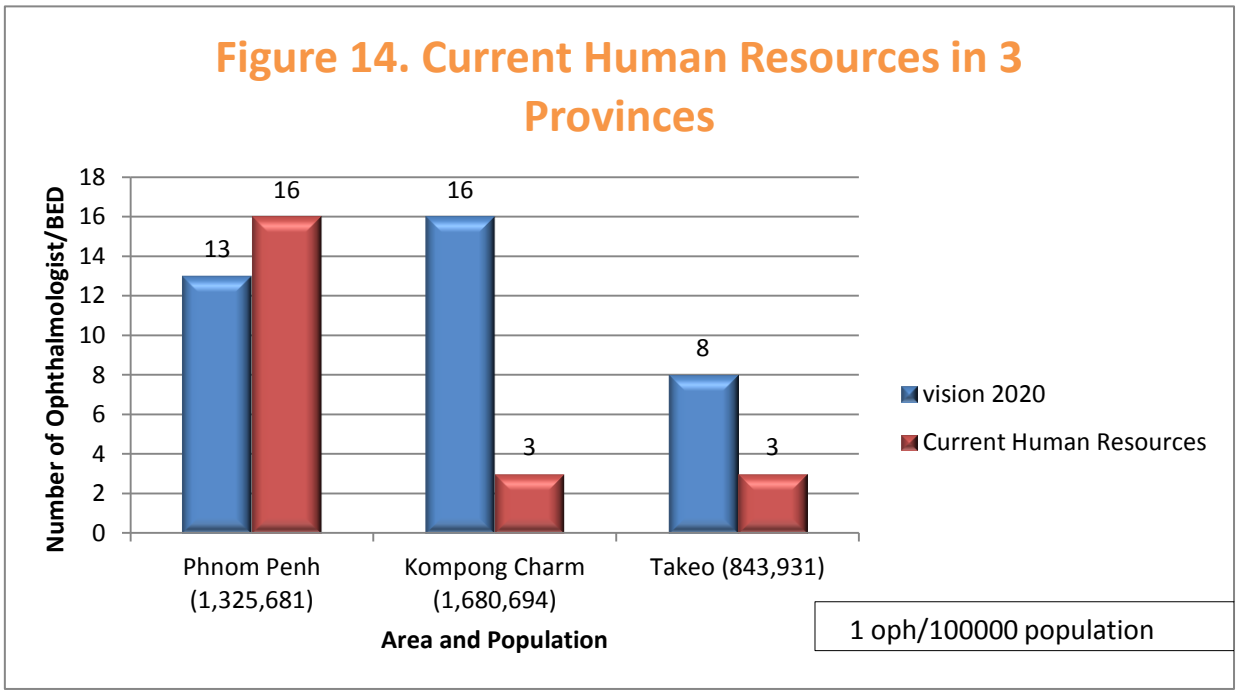
- Ophthalmologist: 4 years of training (Diploma in Specialist of Ophthalmology)
- Basic Eye Doctor: 2 years of training
- Ophthalmic nurse: 12 months of training (Diploma in Ophthalmic Nurse)
- Refractionist nurse: 3 months of training
- Trainer of PEC: 2 weeks of training
- PEC (HCS, VHV): 3 days of training

Current Human Resources Situation

Number and Distribution

The number and distribution of eye care personnel is still a concern for NPEH. There is no enough staff to cover all provincial eye units in Cambodia and the distribution of HRH is also uneven between urban and rural areas, particularly compared to population distribution. Where the eye units are available, eye health personnel is severely under-staffed.

Currently, four additional eye units at provincial hospitals (Oudor Meanchey, Preah Vihear, Pailin and Koh Kong) need an ophthalmologist or basic eye doctors. In Kompong Cham province, there is a discrepancy between population density (1,680,694) and eye care staff needed (3 ophthalmologists/basic eye doctor, 3 basic eye nurses, 2 refractionists, 2 nurses). According to WHO recommendations, the number of HRH in Kompong Cham province is insufficient. On the other hand, Takeo province has 843,931 population but it has more eye care workforces (4 ophthalmologists, 18 opthalmic nurses / Basic Eye Nurse, 3 refractionists, 24 others). The reasons for the mal-distribution of eye care professionals include historical reasons, service delivery reasons and funding arrangements. It is also reported that it is very challenging to get staff to work in remote areas since most of medical trainees are from urban areas and do not want to move away from their families. Being based in urban areas, they have access to training opportunities that are not available in rural areas.



Eye Health Human Resources Strategic Plan 2011-2015(NPEH sources) are:

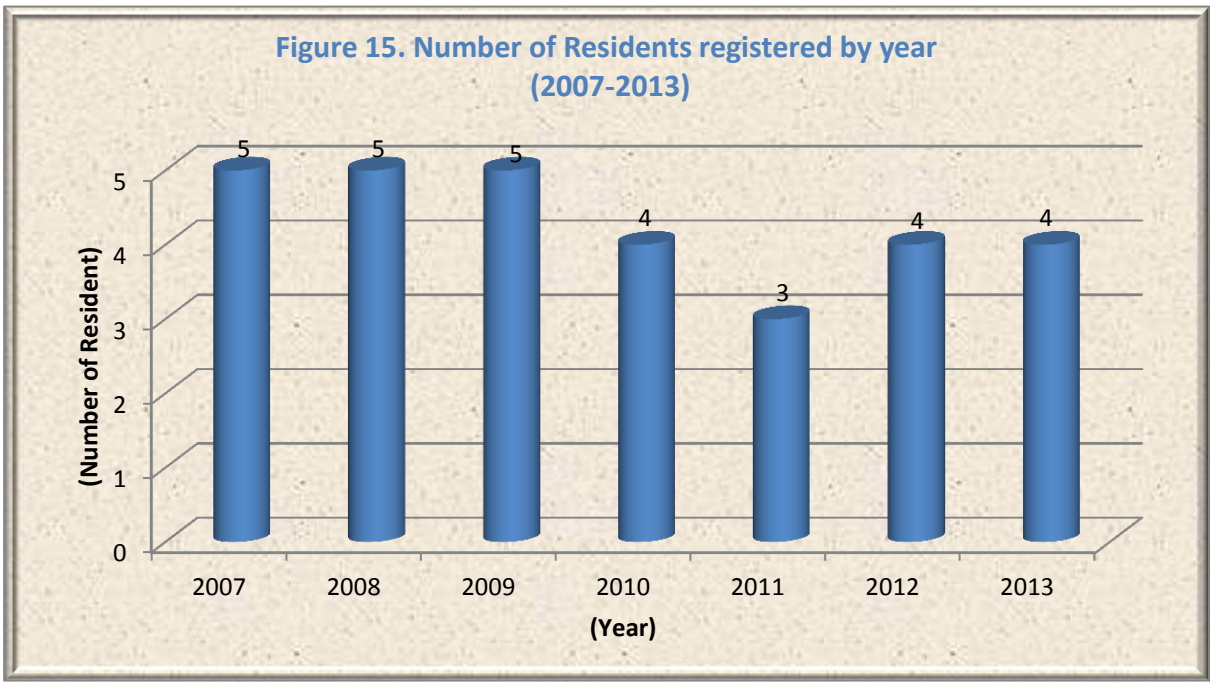
- To increase the number of eye health personnel through quality and comprehensive pre-and in-service training
- To enhance the capacity and skills of eye health personnel already trained through quality continuing education.
- To strengthen human resources planning to improve distribution and reduce mal-distribution of eye health personnel through identification of posts.

The current ratio of eye health workforce in Cambodia is one ophthalmologist/basic eye doctor per a population of 440,000[NPEH sources]and one ophthalmic nurse or basic eye nurse per a population of 183,000. One refractionist is responsible for a population of 455,000.[NPEH sources]

Human resources for eye care 2012			
Category	**urban**	**rural**	**Total**
Ophthalmologist	**14**	**11**	**25**
Eye doctor	**13**	**1**	**14**
BED	**1**	**8**	**9**
Ophthalmic Nurse, eye nurse, and BEN	**7**	**70**	**77**
Refractionist technicians	**14**	**17**	**31**
Primary Eye Care trainer	**7**	**93**	**100**
Primary Eye Care Worker		**1293**	**1293**
Village Health Volunteer		**978**	**978**
Equipment Technician		**4**	**4**

Ophthalmologists

The ophthalmology residency training program was established in 2007 by the Ministry of Health and NPEH and implemented by the University of Health and Sciences supported by two partners NGOs: Fred Hollows Foundation and Eye Care Foundation. The training project ended in 2012 and the new project and curriculum is being established for the next five years. There are usually visiting lecturers in the anterior and posterior segments from USA, Australia, and the Netherlands to teach the residents. Currently, there are 19 residents who have finished the training and 11 residents who are under the training program.



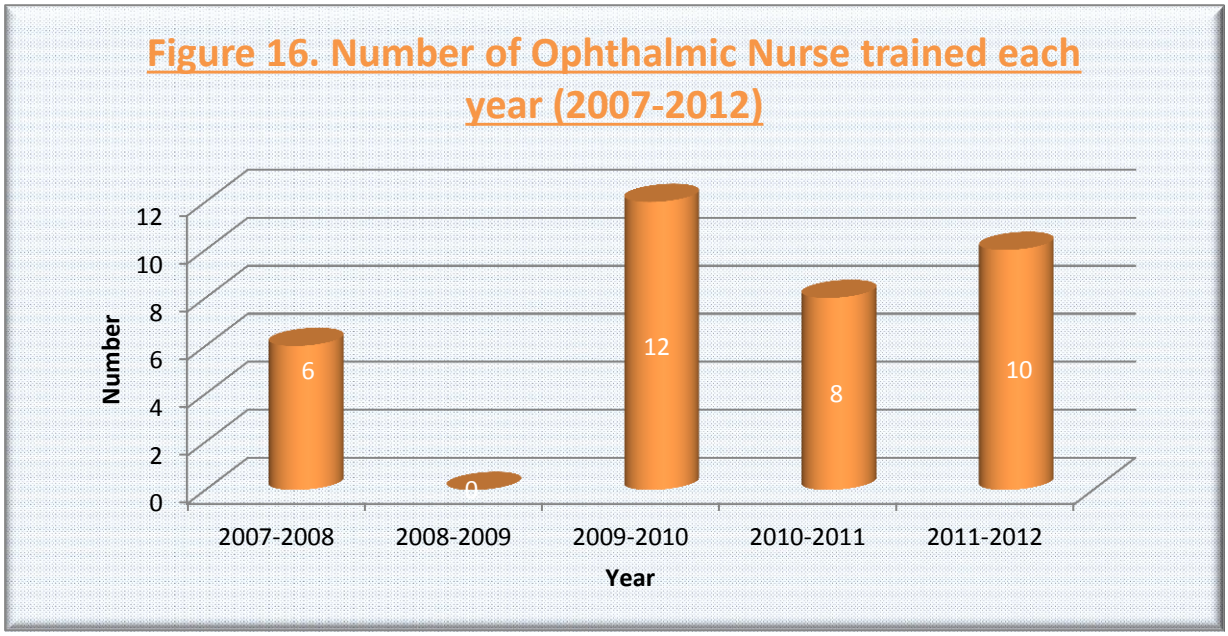
The Vision 2020 target ratio is one ophthalmologist per 100,000 populations. Using an estimated population of 14 million, Cambodia needs about 140 ophthalmologists or basic eye doctors. Currently, there are 25 ophthalmologists and 9 basic eye doctors in Cambodia indicating that 106 additional ophthalmologists need to be trained in the following years to meet recommendations. Interviewees reported that the number of students in ophthalmology has increased over the years with the increased training capacities of the country. However, continuous improvement in capacity and quality of training remains a great challenge for NPEH. Two to four medical doctors are chosen every year into the residency training program, pending coordination and discussion between University of Health and Sciences, partners, MOH, and NPEH.

Ophthalmic nurse training

Over the span of 16 years (1997-2012), 77 ophthalmic nurses/ BEN were trained. TEH is the ophthalmic nurse training center in collaboration with Kompot regional Technical School of Nursing, Caritas/CBM and other NGOs partners. Vision 2020 set out a target that each ophthalmic nurse should ideally be responsible for 50,000 populations. Based on the

population of Cambodia, an extra of 203 ophthalmic nurses should be trained in the following years.

Usually, nurses for specialist training are recruited by provinces to ensure that these nurses will return to their respective provinces after training. Another criterion for selecting general nurses for specialist training in eye care is that they already receive a salary from government.

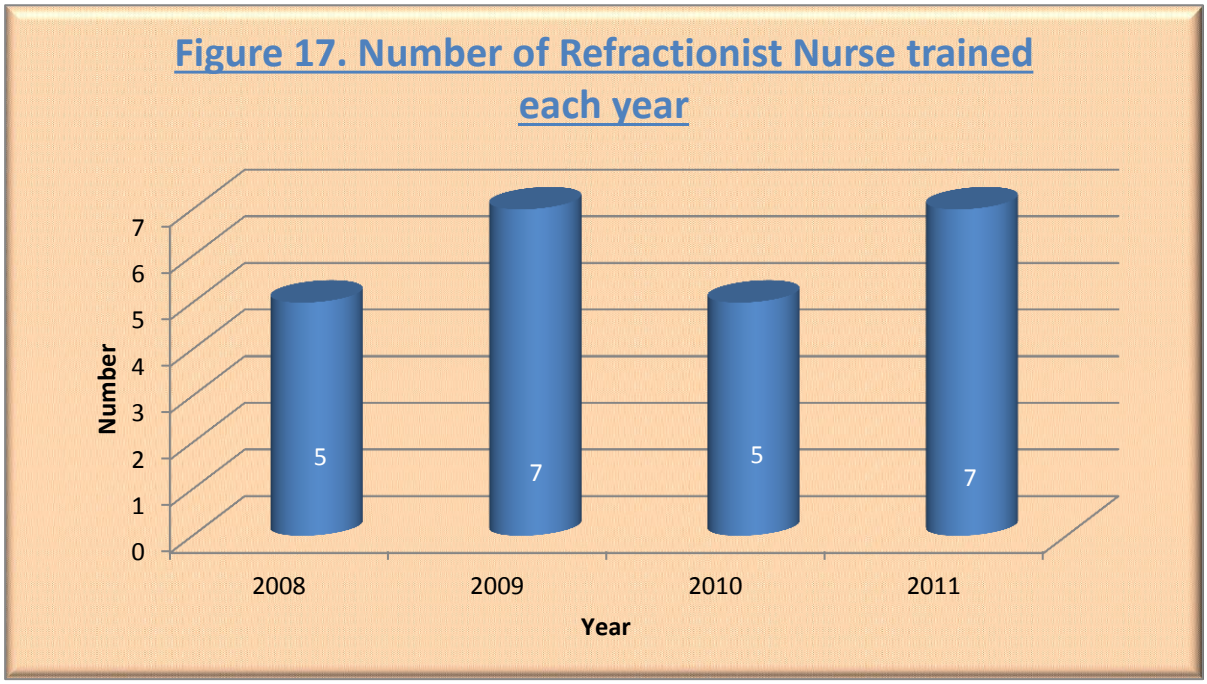


Refractionist nurse training

Refractive errors remain the leading cause of visual impairment in Cambodia. The training of refractionist nurses is very important for refraction service delivery in the public sector as well as for the eye health education of the population. The training started in 2008 under the collaborative partnership of FHF Australia, the International Center for Eye Care Education (ICEE) Australia, and the Ministry of Health through the national program for eye health. The criterion for choosing candidates for refraction training is that they are already ophthalmic nurses working in eye units.

Recently, NPEH and MOH have developed the curriculum for the training of refractionist nurses to be able to work in the eye units of referral hospitals throughout the country. The curriculum covers competencies for caring and improving the patients who have eye problems. As there is a shortage of ophthalmic nurses, the training in refraction will be extended to general nurses. It is therefore necessary to develop and expand the curriculum for the training of refractionist nurses to 6 months to accommodate general nurses.

During the period of 5 years (2008-2012), 31 refractionist nurses were trained. In order to reach the 1 refractionist/ 100,000 population target, 109 refractionist nurses should be trained in following years.



Primary eye care training

Training of trainers (TOT) for primary eye care

This training has been organized every 2 years since 2003 for ophthalmic nurses and nurses from provincial health departments. Currently, there are 100 primary eye care (PEC) trainers (7 in city and 93 in provinces). This training is funded by several NGOs.

There is a standardized PEC training at health centers with the national guideline produced by NPEH collaborated with NGOs (NPEH sources). In addition, the PEC trainers' guideline has also been produced and implemented accordingly.

Primary eye care training includes members of village health support groups, who are exposed to primary eye care trainings. This training is organized by NPEH in close collaboration with provincial health departments and NGOs active in eye health. Primary eye care training is also provided to HC staff, especially ophthalmic nurses and eye care nurses.

NPEH report showed that, in 2013, there were 1,293 primary eye care workers and 978 Village Health Volunteers (VHV) throughout the country. Interviewees reported that most of the PEC workers are not active. They were just trained but did not apply what they've learned to promote eye health.

All eye units usually have 1 or 2 courses of PEC training per year and each course has 10 to 15 candidates. Almost all provinces are covered by primary eye care staffs and VHV. The purpose of this training is mainly focused on eye care education, referral system, and basic eye diagnosis and treatment at community level. Interviewees reported that the staffing of primary eye care theoretically supports the delivery of primary eye care but in practice there is a low rate of referral from primary eye care level to eye care units.

Sub-specialty training

To address the need of sub-specialty services, NPEH is planning to provide fellowship (sub-specialty) training in:

- Pediatric ophthalmology
- Medical retinal
- Cornea and refractive surgery
- Glaucoma
- Neuro-oculoplastic
- Master of community ophthalmology

Policy, Strategy, and HR Management System

There is a national HRH strategic plan, which includes eye care. The components of the strategy are improving skills and competency, professionalism ethics and equality of care, salaries remuneration, and performance incentives.

The national strategic plan for blindness prevention and control 2008-2015 states that by 2015, there will be sufficient number and fair distribution of mixed skill of eye health personnel. They will be better trained, more competent, well-motivated, and responsive. It involves a range of interventions including improving human resources planning and personnel management, strengthening measures to safeguard the high quality of training with emphasis on pre-service training and continuing medical education in integrated and coordinated manner, upgrading practical training site, and promoting professional ethic practices.

The interventions will engage health/ophthalmic professional associations. National interviewees reported that the MOH has a human resources database (computer-based) that records all the government staffs in the health sector and eye care staffs (employed in government facilities). This is an opportunity for NPEH to analyze HRH and use the data to strategically plan staff allocation, retirement, and promotion. It can also be used to address the training plan issued by NPEH and Cambodia Ophthalmological Association (COS) to address training development through assessment and evaluation, which covers a period of 5 years (2011-2015).

The MOH has issued the formal job description for different eye care cadres (ophthalmologist, ophthalmic nurse, refractionist, and optometrist, primary eye care worker) in order to clearly define the job responsibilities, duties, salary, and tasks. In Cambodia, only the ophthalmologist has the right to perform any kind of eye care surgery and all ophthalmologists and optometrists are government staff.

In order to get certification, the ophthalmologists must pass an examination. After receiving certification, they have to register at the Cambodia Medical Council for a license from the MOH before they are allowed to practice or run a business.

Curriculum Development (Ophthalmology Residency Training, Refractionist training, and ophthalmic nurse training)

To date, FHF and Eye Care Foundation provide funds for training that include funding for lecturers (both local and international lecturers), curriculum development (established in early 2013), and material supplies for enhancing training institutes. The curriculum is usually reviewed every five years by NPEH, and NGOs. Interviewees reported that the collaboration between NPEH, donors, and training institution is going on well.

Education (refresher course)

The goal of the HR for eye care strategy in national strategy plan 2008-2015 is to distribute all eye care workforces to every province in Cambodia in order to provide the service delivery timely and sufficiently, and to provide the unmet needs. The number of each cadre trainee chosen each year, depends on the real need of organization through discussions and negotiations between MOH, NPEH and Partners. It is reported that almost all eye care workforces are government staff and those trained 5 years ago are still working in the same field.

Continuing Medical Education (CME) is conducted twice a year when Ophthalmologists, ophthalmic nurses, refractionists receive a two-day refresher course. It provides clinical experiences and improvement for all candidates. Besides CME, some facilities also provides refresher courses for primary eye care workers.

Monitoring and Supervision

The NPEH is officially responsible for clinical supervision. The NPEH supervises the eye units once or twice a year depending on available funding. Interviewees reported that some eye units (around 50 percent) have not had any supervision for several years (e.g. Kompong Cham and Thbong Khmum eye units).

NPEH stated that the objective of supervision is to check up the clinical or technical support, and provide supplies (instrument) needed in facilities. In addition, supervision covers the coordination between eye unit and hospital director or PHD as well. Day-to-day clinical supervision is often missing, particularly in remote areas where there are fewer eye care workers. Interviewees at facility level reported that the medical superintendent is theoretically responsible for all the health workers in that facility. They can only monitor activities but they may not be able to effectively monitor the clinical skills in eye care. As a result, supervision by the facility management structures tends to be more administrative rather than clinical.

Key findings

Strength

- Almost all eye care workforces are government staff.
- Continuing Medical Education (CME) is regularly done (twice a year) to improve clinical skill for all cadres of eye care and ensure the quality of eye care service delivery.
- The capacity for training is increasing over time and the intake of medical students into specialist of ophthalmology is improving.
- Primary health care staffs and VHV are trained in basic eye condition, eye care education, and referral system.
- There is a HRH database (computer-based) available, which includes eye care staff information that can be used for planning.
- The identification of posts for all residents is effective in reducing the mal-distribution of HRH.

Weakness

- Shortage of all type of eye health personnel and mal-distribution is associated with limited training capacity.
- Financing of training heavily depends on NGOs fund
- Sub-specialty trainings are not available yet.
- Supervision is done irregularly depend on available fund
- Recruiting and retaining eye care personnel in rural areas remains a significant challenge in Cambodia
- There is no system to monitor and evaluate the impact of PEC training.

Medicines, products and equipment for eye health

Eye care medicines and consumable expenditures

It was reported that the number of ophthalmic supplies such as suture, IOL, viscoelastic materials, eye drops, and other ophthalmic materials were provided to eye department in Phnum Penh and some provinces through the Central Medical Store of the Ministry of Health. However, data of total expenditure on different types of medicines and consumables for eye care are not available. The accurate data on financing for eye care medicines at either public or private facility level is limited.

The government does not provide any eye care equipment such as microscope, slit-lamp, retinoscope, and other surgical instruments to program or facilities. So far, the majority of drugs and eye care equipment are donated by donors such as FHF, CBM/ Caritas, Eye Care Foundation.

Pharmaceutical policy, laws, and regulations

The national essential medicine policy was first created in 1995 and recently updated in 2010 and followed in 2012 (annex 12). This policy included medicines specifically for eye care. In the National Essential Medicine List NEML, there are 12 eye care medicine.

The revised medicines policy was intended to ensure reliable supply of quality medicines for all citizens of Cambodia and support the health strategic plan 2008-2015.

The medicine policy doesn't specify any specialty or subject. The general purpose of a national medicine policy are as follows:

- Access: equitable availability and affordability of essential medicines.
- Quality: the quality, safety, and efficacy of all medicines.
- Rational use: the promotion of therapeutically sound and cost-effective use of medicines by health professionals and consumers.

Data on the quality of pharmaceutical products was collected consecutively. The priority items for post-marketing surveillance are anti-malarial drugs, antibiotics, anti-TB, and some essential drugs. Post-marketing surveillance is a practice for monitoring the safety of a pharmaceutical drug or medical device after it has been released on the market and is an important part of the science of pharmacovigilance. Currently, there is no data available about efficacy, quality and safety of eye care medicines collected at facility-level.

The interviewee stated that in order to get that information, we need strong commitment and corporation from every eye care doctors but it seems so difficult to get their commitments. Therefore, NPEH should advocate for or put this issue into some part of the strategic plan in order to get it proceed in the future.

The NEML also gives some specific ophthalmic consumables such as Intra-Ocular-Lens (IOL), eye shields, sterile eye pads, sutures (polyglycolic acid double arms spatulates 6-0 and black monofilament double arms spatulates 30cm. However, there is no other basic eye care equipment such as Snellen Charts, near reading cards, or torches are mentioned in NEML.

It is reported that those medicines are not enough for eye care service delivery at facility. In addition there are many more medicines needed based on the national guideline for treatment of eye condition in Cambodia that are not available in NEML such as antibiotic eye drops (Fluoroquinolon, Gentamycine, Tobramycine) used in Bacterial corneal ulcers, some anti-fungal agents (Natamycine 5%, voriconazole) and other combined anti-glaucoma agents are missing.

Combination glaucoma drugs are more expensive, but more effective, and some may only need to be used once per day which would increase patients' compliance to glaucoma treatment. Moreover, dry eyes treatments (methyl cellulose eye drops), and any anti-allergic treatments (sodium cromoglycate eye drops) are not available in NEML. This kind of treatment is important as these preparations are used to treat common eye conditions such as

conjunctivitis or red eye, and should be available in primary eye care facilities where primary eye care facilitators are expected to treat basic eye conditions. Antibiotics tend to be extensively prescribed, which may contribute to drug resistance.

Another opportunity for NPEH to advocate for the inclusion of specific accessible and affordable drugs is through the national therapeutic committee which is composed of relevant experts. This committee decides which drugs should be offered throughout country.

Procurement and drug stock controlling

It was reported from facilities that the allocation and procurement of drugs are still a concern. Because most eye units in Cambodia are located in provincial referral hospitals, drugs are distributed via provincial health departments to hospital pharmacies stores. The eye unit has to request medicines from hospital store.

Interviewees reported that the allocation of drugs to their facilities is not timely available due to shortages. In addition, it is often difficult to get access to specialized drugs via hospital pharmacies. This is the reason why NGOs directly supply drugs, consumables and some eye care equipment to eye units.

In the Kompong Cham eye unit, interviewees stated that drugs are not supplied by hospital pharmacies because those drugs are donated to patients until the stock is cleared. If the needed drugs are not available, patients have to take prescriptions and buy them outside in private pharmacies.

On the contrary, TEH is not located in the provincial referral hospital so they have their own management procedures to procure their own drugs and equipment. Patients can access many eye care drugs through their hospital pharmacy store (cost-recovery mechanism). Interviewees reported that they occasionally received drugs from the Provincial Health Department. Some part of the expenses are covered by CBM/ Caritas's fund and the rest is the user fee income generated by facility (registration, medicines, glasses, and surgical fee).

Appropriate Use

There is a national guideline for treatment of eye condition produced in 2012 which covered around 20 common eye diseases.

This treatment guideline was developed by a group of eye care professionals in Cambodia which complies with the Cambodian Medical Council Guideline. This guideline provides eye care professionals in the country with a reference to ensure the quality and high standard of eye care delivery. However, it only applies to specialist hospital-level care so is limited use for PHU-level care.

Mostly, eye units have only clinical protocols to perform in their regions but these protocols are not standardized.

Financing on medicines and equipment

To date, there has never been government financial support for eye care equipment. That equipment has been donated from NGOs directly to facility. There is no accurate data on the amount of spending on eye care medicines by government, donors, or individuals.

In addition, there is no system to recover the cost of eye care medicines dispensed through MOH facilities. Some interviewees reported that recently there was no regulation to control the price of eye care medicines in the private sector. Hopefully, this issue will be addressed soon.

Key Findings

Strength

- The National Essential Medicine List includes key eye care drugs and consumables.
- NPEH has an opportunity to advocate for the inclusion of key eye drugs missing into the NEML.
- There is a national guideline for treatment of eye condition in Cambodia produced in 2012.
- Health policy and regulation is applied to eye health.

Weakness

- There is a lack of accurate data on the amount of spending on eye care medicine as well as equipment via government or donors.
- Specialized eye care drugs are not always available in government facility.
- NEML covers only some medicines and there are some key eyes drugs are missing.
- There is no standard treatment guideline at PHU (PEC).
- There is a lack of basic eye care equipment at primary level. eg: charts.
- There is no equipment has been provided by government so far.

Eye Health Information Systems

Information Products

Disease surveillance reports are produced in Cambodia that cover 52 diseases. The information is collated by MOH on mobility, mortality, and health service activity. Recently, most of the reports sent directly to MOH are computer-based systems. Where there is no electricity in health centers, paper- based reports are sent to district health department (computer-based).

It is reported that almost all districts in Cambodia have access to computers and electricity. Interviewees at the national level stated that 90% of the reported data are timely and complete. The priority of disease surveillance is about communicable diseases such as malaria, TB, hemorrhage fever etc.

Eye care data is also included in the report but this data is not complete. Interviewees showed that eye unit's reports to NPEH are more specific and detailed than those sent to MOH via the health information system.

Indicators

An impact indicator of eye health intervention (namely prevalence of blindness) is included in the MOH monitoring and evaluation framework of the HSP2. In addition, data related to a number of immediate outcome and output indicators of service performance are available in the web-based health information system (HIS) of the MOH, and reported routinely from all health centers and hospitals in monthly basis. Within in the information compiled, there is no reliable data about eye injuries.

Eye health data in MOH

Web- based HIS (eye health indicators)

The National Program for Eye Health has implemented a database for recording eye diseases (eye diseases, cataract, trachoma, corneal ulcer, glaucoma) by using international classification of disease (ICD10) coding which also requires eye units reporting directly to the NPEH however the system is not integrated into the MOH HIS. The NPEH collects the data only from eye units (21 throughout the country). The data from PEC are usually not captured by NPEH. The Health Centers send data about several eye health indicators that has been integrated into the MOH HIS, via web-based HIS of ministry of health.

HIS resources

So far, there is no national eye care budget that includes staff and other resources for routine eye health information and statistic functions. INGOs do not seem to be funding health information systems for eye care, although Sightsavers supports the NPEH manager to collate data.
On May 29, 2013 the Fred Hollows Foundation supported the NPEH to conduct a workshop on eye health information system held in Phnum Penh. Around 150 participants from Department of Planning and HIS of MOH, NPEH members, Partner NGOs, head of eye units in provinces, head of person responsible for report in eye units were invited to join this workshop. The purpose of this workshop was to revise and update the existing Eye Health Information System (EHIS) and introduce the possible integration into MOH Health

Information System (HIS). Hopefully, the new revised EHIS will be developed by NPEH and approved for eye units to implement soon.

A survey[conducted in 2004 by FHF] with post-operative cataract patients in three provinces in Cambodia showed that over 90% of respondents reported that their quality of life had improved after sight-restoring surgery; that they no longer needed anyone to look after them; and that they could assist in cultivating crops and working around the house.

Interviewees also reported that investment in those types of studies were necessary and would support the advocacy efforts of the NPEH. There is a lack of funding available to conduct research on level of uptake, level of compliance, impact of school screening on educational achievements and return on investment.

Data sources

Every PHU is supposed to collect morbidity and mortality data and submit report to the department of planning and health information system. There are 5 eye care indicators included (eye diseases, cataract, trachoma, corneal ulcer, glaucoma). The focus of data collection and reporting at PHU level is mostly on diseases or activity relevant to mother and child health, HIV/AIDS, malaria and dengue. Eye units also send reports to the hospital director, then to PHD before handing to NPEH.

Quarterly report is sent by every eye unit. The data is mainly collected on HRH, eye care activities, and equipment available in the facility. Reports tend to cover the number of OPD seen by broad medical condition, age (adult/child) and gender. In-patient department patients and surgical cases are also recorded according to the report template of NPEH. However, some eye unit didn't provide any data on new/old patients or the location of patients using the services.

It was noticed that TEH's report that included new modified templates in 2013, mentioned the patients origin and identified patient consultation as either new or old patients. In the Caritas report form disability patients are also taken some part of report. The NPEH report form that all eye units use does not capture more information as the report templates sent to NGOs. CBM or Caritas created several forms, however in other situations, the level of detail and type of information varies from one NGO to another. This data is not reported in the NEPH form.

Some interviewees at facility level reported that outpatients' statistics in some areas may be inaccurate due to poor record keeping and the registration forms are usually not completed thoroughly. Regarding eye care-specific indicators which are determined by NPEH, TEH tends to collect and report more details on eye health data than other eye units, including diagnosis and cataract surgical outcomes or number of referrals to CDMD, as they also required to report to CBM. Some eye units collect and record more detailed information on diagnosis and treatment that are not reported to NPEH.

NGOs always provide to NEPH their annual report, which covers the disease control (IPD, OPD, screening (school screening), surgery, glasses provided..), human resources development, facility development, and awareness or health education activities to patients.

Some interviewees reported that the information from overseas eye camp team such as Vietnam outreach, was not captured because they did not register. In addition, the data from overseas outreach was not captured by NPEH or health authorities.

NPEH reported that the information from private providers is still limited. Private clinics do not usually provide the information about their clinic's business to NPEH. They said they do not have proper data collection.

Data management and dissemination

Eye care units reported that there is a lack of understanding about the meaning of data collected because after sending the report to the national level, they do not receive any feedback from the NPEH about their activities in eye care. They said that without feedback mechanism, they don't think that data collection is meaningful. An eye unit stated that their report was regularly sent to NPEH but no measure was taken by NPEH to improve their compliance. During 2 consecutive years, the same unit did not have any supervision or monitoring from NPEH.

PHDs reported that they usually provide feedback about data collection to local facilities which mostly concerned mother and child health or delivery issue rather than eye care problems. PHDs did collect on eye care conditions and sent data to MOHs without providing any feedback to eye units.

NPEH also stated that some eye units do not regularly send their reports but information came from NGOs that have their information system. After receiving data, NPEH calculates the CSR (based on population- based survey) and analyses the results by province.

Key Findings

Strength

- There is a standardized reporting templates used in the country and coordinated by NPEH.
- Innovative reporting forms exist in some eye unit created by NGOs.
- A new revised EHIS has been developed by NPEH and will soon be implemented.
- A standardized HIS of MoH, which is used in the whole country, includes eye health indicators.

Weakness

- There is no feedback from NPEH about facility's performance after supervision.
- Cataract surgical outcome is not recorded by all eye units.

- Surgeries conducted by Vietnam outreach teams were not captured in the health information system.
- There is still a small percentage of eye units that do not submit the three monthly reports of their activities at the eye units. .
- Data reported by eye units is not always accurate and valid.
- Lack of standardized eye health monitoring system, Instead, various reports are produced by different NGOs etc.

Executive Summary

Governance of the Eye Health System

Key Findings

Strengths

- NPEH has good relationships with many departments at MOH including the Secretary of State.
- NPEH has the capacity and ability to mobilize funds from donors.
- Eye care is included in the Cambodia minimum package of care that includes management of refractive error, trachoma and cataract.
- Active DPOs (ABC, CDMD, Krousar Thmey) work in CBR in a number of provinces.
- Health sector regulations are applied to eye health.
- TEH collects information on patient's satisfaction and cataract surgical outcome.
- The RAAB survey was conducted in 2007 and generated strong evidence on blindness in Cambodia.
- NPEH has a good relationship with donors and represent a key actor for coordination between eye care providers in the country.
- A strong national strategic plan for blindness prevention in line with government and health strategic plan has been developed.
- Infrastructure capacity development has significantly increased over the last 10 years.

Weaknesses

- There is limited opportunity for DPOs to have a voice or be involved in eye care service planning or budgeting.
- There is no feedback mechanism from service users about quality and cost of eye care services provided.
- Eye units are only delivered in provincial referral hospitals (only one eye unit is in Tbong Khmum district referral hospital).
- At the provincial level, eye care is not the priority concern.
- There is a lack of evaluation of PEC training practices, including lack of supervision of trained staff and lack of refresher course.

Eye Health Financing

Key Findings

Strengths

- The national eye health budget is integrated into CPA and MPA (basic benefit package) budgets of MOH.
- The Health Equity Fund can reduce the financial barrier to eye care services.
- NGOs provide funding for outreach activities in remote areas, which has the positive impact on CSR.
- The eye health system is highly supported by international donors and NGOs.

Weakness

- User fees are not standardized.
- Most of government eye units are separated from the rest of the hospital because funding for consumables and drugs come directly from NGOs.
- Budget for eye care from MOH is far below the appropriate level of funds required for supporting eye health service delivery to meet eye health needs of the population.
- Eye care heavily depends on NGO funding that could influence the long term sustainability.
- The majority of eye care program is funded by INGOs.
- Cost is the main barrier for accessing cataract surgical services.

Eye Health Service Delivery

Key findings

Strengths

- There is a national treatment guideline produced in eye health system to improve the standardized quality of services delivered.
- The number of people accessing eye care services nationally has markedly increased by reducing financial barriers thanks to Health Equity Fund and subsidies.
- Outreach services are effective and available to contribute to clear the cataract backlog at remote areas.
- Eye care services are included in the essential services of the HSP2 framework.
- There is an integration of PEC into PHC network through the training of health care workers or community nurses about some basic eye conditions and referral system.
- Eye health education is integrated with other outreach activities such as vaccination, maternal child health, sanitation and hygiene, and micronutrient supplementation

Weaknesses

- The CSR is too low to deal with the incidence and prevalence of blindness due to cataract.
- Outreach services are almost exclusively done by NGOs exemplifying that most of the service delivery heavily depends on external funding, which threatens the long term sustainability of eye care.
- There is a lack of clinical supervision on PEC and supervision activity.
- The referral system is poor.
- There is no standardized quality measurement of eye care service delivery throughout the country.
- There is a lack of communication between eye care service providers and authority.
- There is a lack of equipment for eye care at primary level.
- There is a lack of eye care service at Referral Hospitals.
- There is a lack of services at the primary as well as district level.
- There is a lack of low vision or visual rehabilitation services

Human Resources for Eye Health

Key findings

Strength

- Almost all eye care workforces are government staff.
- Continuing Medical Education (CME) is regularly done (twice a year) to improve.
- Clinical skill for all cadres of eye care ensure the quality of eye care service delivery.
- The capacity of training is increasing over time and the intake of medical students into specialist of ophthalmology is improving.
- Primary health care staffs and VHV are trained in basic eye condition, eye care education, and referral system.
- There is a HRH database (computer-based) available, which includes eye care staff information that can be used for planning.
- The identification of posts for all residents is effective in reducing the mal-distribution of HRH.

Weakness

- Shortage of all type of eye health personnel and mal-distribution associated with limited training capacity.
- Financing of training heavily depends on NGO funds.
- Sub-specialty trainings are not available yet.
- Supervision is done irregularly and dependent on available fund.
- Recruiting and retaining eye care personnel in rural areas remains a significant challenge in Cambodia
- There is no system to monitor and evaluate the impact of PEC training.

Medicines, Equipment, Products for Eye Health

Key Findings

Strength

- The National Essential Medicine List includes key eye care drugs and consumables
- NPEH has chance to advocate for the inclusion of key eye drugs missing into the NEML
- There is a national guideline for treatment of eye condition in Cambodia produced in 2012.
- Health policy and regulation is applied to eye health

Weakness

- There is a lack of accurate data on the amount of spending on eye care medicine as well as equipment via government or donors.
- Specialized eye care drugs are not always available in government facility.
- NEML covers only some medicines and there are some key eyes drugs are missing.
- There is no standard treatment guideline at PHU (PEC).
- There is a lack of basic eye care equipment at primary level. eg: charts.
- There is no equipment has been provided by government so far.

Eye Health Information System

Key Findings

Strength

- There is a standardized reporting templates used in the country and coordinated by NPEH.
- Innovative reporting forms exist in some eye unit created by NGOs.
- A new revised EHIS has been developed by NPEH and will soon be implemented.
- A standardized HIS of MoH, which is used in the whole country, includes eye health indicators.

Weakness

- There is no feedback from NPEH about facility's performance after supervision.
- Cataract surgical outcome is not recorded by all eye units.
- Surgeries conducted by Vietnam outreach teams were not captured in the health information system.
- There are still some eye units which do not send quarterly reports of their activities at the eye units.
- Data reported by eye units are not always accurate and valid.
- There is a lack of standardized eye health monitoring system because various reports are produced by different NGOs etc.

Annex1: Timetable of EHSA in Cambodia

Date	Activity
22, April 2013 (Monday)	Working Group Discussion - EHSA concept understanding - Review modules or probing questions - Name team leaders and assessment teams - Discuss about appropriate schedule for data edition and analysis
23, April 2013 (Tuesday)	Working Group Discussion - Set up a contact-list for stakeholders - Indicate mapping for data collection discussion - Probing questions interview practice
24, April 2013 (Wednesday)	EHSA interview - Contact stakeholders - Determine schedule for field trip - Probing questions practice
26, April 2013 (Friday)	Data Collection - Phnom Penh city: interview with donors (FHF, Eye Care Foundation, Iris, Seva)
29, April – 1, May 2013	Continue Data Collection - National program for eye health manager - National coordinator for prevention of blindness and vision 2020 - Organization (DPOs=>ABC,CDMD), Diabetic Association - Nursing school trainers
6-9, May 2013	Data Collection - Kompong Cham province: - Provincial places: provincial referral hospital, eye unit - District Level: Tbong Khmum district depart, eye unit, district hospital
10, May 2013	Summarize Data Collection - Review and verified collected data - Find out any gap or data that is still needed - Document review
13-16, May 2013	Data Collection - Takeo province: Province level, District level
17, May 2013	- Review data collected and summarize - Back to Phnom Penh
20-22, May 2013	- Continue Data collection: National level stakeholders, MOHs - Document review
23-15, June 2013	Repot writing

Annex2: Eye Health System Assessment Team

Name	Title and Organization	Team Role
1. **Prof. Ngy Meng**	Chairman of NPEH Director of KSFH	Team Leader
2. **Prof. Do Seiha**	National Coordinator for Prevention of Blindness and Vision 2020 Vice Chairman of NPEH	Team Leader
3. **Dr. Karl Blanchet**	Lecturer and Health Systems Researcher, International Center for Eye Health, London School of Hygiene and topical Medicine	Technical Support
4. **Dr. Sau Sokunvory**	Assistant coordinator of NPEH Secretary for the COS	Team Member
5. **Dr. Sok Kheng**	Ophthalmologist at KSFH	Team Member
6. **Ms. Sokhem Vong Sovannary**	Secretary of NPEH	Team Member

Annex3: List of Stakeholders Interviewed

Name	Title	Organization
National Level		
1. **Dr. Lo Veasnakiry**	Director of Department of Planning and health Information System	MOH
2. **Dr. Sok Kanha**	Director of Finance Department	MOH
3. **Dr. Prak Piseth Raissy**	Director of Preventive Medicine	MOH
4. **Mr. Chea Chiv Srong**	Director of Central Medical Store	MOH
5. **Dr. Heng Pamkiet**	Director of Department of Drug and Food	MOH
6. **Prof. Ngy Meng**	Chairman of NPEH Director of KSFH	NPEH
7. **Pro. Do Seiha**	National Coordinator of Prevention of Blindness and Vision 2020 Vice Chairman of NPEH	NPEH
8. **Dr. Sau Sokunvory**	Assistant Coordinator of NPEH	NPEH
9. **Dr. Kuy Vanny**	Diabetologist	Calmet Hospital
10. **Mr. Seth Sam Ath**	Country Manager of FHF	Sight saver
11. **Mr. Thong Mun Leng**	ECF Country Representative	Sight saver

12. Mr. Te Sereybonn	Program Director of Caritas THE	Sight saver
13. Mr. Vann Ratana	Country Manager of Seva Foundation	Sight saver
14. Mr. Bourn Mao	Director of Association of Blindness in Cambodia	Sight saver (DPOs)
15. Mr. Neap Thy	Director of CDMD	Sight saver (DPOs)
Takeo Province		
16. Mr. Te Sereybonn	Director of Hospital	Takeo Eye Hospital
17. Mr. El Nimeth	Administrative Manager	Takeo Eye Hospital
18. Dr. Neang Mao	Technical Director Ophthalmologist	Takeo Eye Hospital
19. Dr. Chea Ang	Ophthalmologist	Takeo Eye Hospital
20. Mr. Nol Rathana	Refractionist Head Nurse	Takeo Eye Hospital
21. Mr. Chum Samith	Deputy Head Nurse	Takeo Eye Hospital
22. Mr. Ponlork	Ophthalmic Nurse Trainer	Takeo Eye Hospital
23. Dr. Vong Chrean	Low Vision Director Medical doctor	Takeo Eye Hospital
24. Mr. Chrek Vannak	Ophthalmic Nurse Vision Center Manager Primary Eye Care Facilitator	Kirivong
25. Ms. Mun Makara	Ophthalmic Nurse	Kirivong
26. Mr. Roy	Pharmacy Store Manager	Takeo Eye Hospital
Kompong Cham Province		
27. Dr. Khun Seng	Medical Doctor Vice Director of Kompong Cham Referral Hospital	Kompong Cham
28. Dr. Por Narin	Basic Eye Doctor Eye Unit Director	Kompong Cham
29. Dr. Samuth Phearun	Basic Eye Doctor	Kompong Cham
30. Mr. Saing Setha	Refractionist	Kompong Cham
31. Mr. Cheng Bunnarith	Refractionist	Kompong Cham
32. Mr. Thai Chheng Leang	Ophthalmic Nurse	Kompong Cham
33. Ms Da Sotheany	General Nurse	Kompong Cham
34. Dr. Poch Thaly	Basic Eye Doctor	Thbong Khmum
35. Mr. Kang kethya	Ophthalmic Nurse	Thbong Khmum
36. Mr. Khoun Sokkhy	Ophthalmic Nurse	Thbong Khmum
37. Mr. Yi Samky	Pharmacy Store Manager	Thbong Khmum

Annex 4: Document Review

Key documents (Health policies, strategy documents, programme documents) were reviewed during data collection and analysis and are listed below.

List of documents reviewed:

1. Operational Manual (HSSP2) (2009-2013), MoH
2. Medicine Policy of the Kingdom of Cambodia 2010, MoH
3. Health Strategic Plan 2008-2015, MoH
4. National Strategic Plan for Prevention of Blindness 2008-2015, NPEH
5. National Essential Medicine List 2012, MoH
6. Health Service Delivery Profile Cambodia 2012, MoH
7. National Program for Eye Health Annual Report 2011
8. Report on the Socio- economic impact survey of post-operative Cataract Surgical Patients in three provinces of Cambodia 2004, FHF
9. Rapid Assessment of Avoidable Blindness (RAAB) in Cambodia 2007
10. National Health Statistic Report 2011 of DPHIS, MoH
11. Annual Health Financing Report 2010, MoH
12. HIS monthly report for Hospitals, DPHIS of MoH
13. National Guideline for Treatment of Eye Condition in Cambodia 2012, NPEH &COS
14. A Review of Health Leadership and Management Capacity in Cambodia 2011, Human Resources for health knowledge (Hub)
15. Health Sector Progress in 2012, DPHIS (MoH)
16. Briefing paper: Health Care in Cambodia, David I. Lanin and Rachel Gardner (2008)
17. Implementation of the Health Equity Funds Guideline 2009, MoH
18. National Workshop on Review of National Strategic Plan for Blindness Control in Cambodia 2008-2015 Report 2011, NPEH
19. A case study: waivers, exemptions, and Implementation issues under user fees for Health care Equity Funds and other Waiver System in Cambodia
20. Disability Inclusive Practice in Eye Health; A Practice Guide, CBM

Vision 2020 Australia Global Consortium

Annex 5. Principle Causes of Blindness in Person: BA<3/60 in better eye with available correction in 2007 (Source: RAAB, 2007)

	Male		Female		Total	
	n	%	n	%	n	%
Refractive Error	4	6.7	2	1.2	6	2.7
Cataract, Untreated	36	60.0	132	80.0	168	74.7
Aphekia, Uncorrected	2	3.3	2	1.2	4	1.8
Total Curable	**42**	**70.0**	**136**	**82.4**	**178**	**79.1**
Surgical Complication	2	3.3	1	0.6	3	1.3
Trachoma	0	0.0	1	0.6	1	0.4
Phthysis	1	1.7	2	1.2	3	1.3
Other Corneal Scar	9	15.0	9	5.5	1818	8.0
Onchocerciasis	0	0.0	0	0.0	0	00
Total Preventable	**12**	**20.0**	**13**	**7.9**	**2525**	**11.1**
Total Avoidable	**54**	**90.0**	**149**	**90.3**	**203**	**90.2**
Glaucoma	2	3.3	5	3.0	7	3.1
Diabetic Retinopathy	1	1.7	1	0.6	2	0.9
Potentially Preventable	3	5.0	6	3.6	9	4.0
Globe Abnormality	0	0.0	1	0.6	1	0.4
Age-related macular degeneration	0	0.0	1	0.6	1	0.4
Other Post Segment/CNS	3	5.0	8	4.8	11	4.9
Total Posterior Segment	**6**	**10.0**	**16**	**9.7**	**22**	**9.8**
	60	**100**	**165**	**100**	**225**	**100**

Annex 6. Barriers to cataract surgery, as indicated by persons in sample, bilateral blind due to cataract (VA <3/60, best corrected) (RAAB, 2007)

Barriers	Male		Female		Total	
	n	%	n	%	n	%
Unaware of treatment	2	5.0	24	13.8	26	12.1
Destiny/God's will	0	0	6	3.4	6	2.8
Wait for maturity	1	2.5	1	0.6	2	0.9
No services	0	0	5	2.9	5	2.3
How to get surgery	3	7.5	8	4.6	11	5.1
Cannot afford	14	35.0	47	27.0	61	**28.5**
No company	4	10	20	11.5	24	11.2
No time	2	5.0	2	1.1	4	1.9
Old age: no need	4	10.0	19	10.9	23	10.7
One eye not blind	0	0	0	0	0	0
Fear of operation	4	10.0	24	13.8	28	13.1
Fear of losing sight	1	2.5	10	5.7	11	5.1
Contraindication	5	12.5	8	4.6	13	6.1
	40	**100**	**174**	**100**	**214**	**100**

Annex 7. List of Service Price at Ang Doung Hospital

N°	Type	Fee (Riel)
1	Cataract Surgery (Phaco)	1,200,000
2	Cataract Surgery (ECCE+IOL)	400,000
3	Congenital Cataract	450,000
4	ICCE	250,000
5	Trabeculectomy	250,000
6	Strabismus surgery (Local Anesthesia)	400,000
7	Strabismus surgery (General Anesthesia)	450,000
8	DCR	400,000
9	DCT	150,000
10	Trichiasis	150,000
11	Entropion, Ectropion	250,000
12	Oculoplasty	400,000
13	Pterygium Excision (no graft)	100,000
14	Pterygium Excision (graft)	300,000
15	Evisceration	150,000
16	Enucleation	150,000
17	Small surgery	50,000
18	CWR (Local Anesthesia)	200,000
19	CWR (General Anesthesia)	250,000
20	Scan	150,000
21	Yag Laser	80,000
22	Argon Laser	250,000

Annex 7.1. List of Service Price at Kompong Cham Eye Unit

N°	Type	Fee (Riel)
1	Registration	6,000
2	ECCE+IOLs	320,000
3	ECCE	250,000
4	Trabeculectomy	200,000
5	Pterygium Excision	120,000
6	Lid Surgery	120,000

Annex 7.2. List of Service Price at Takeo Eye Hospital

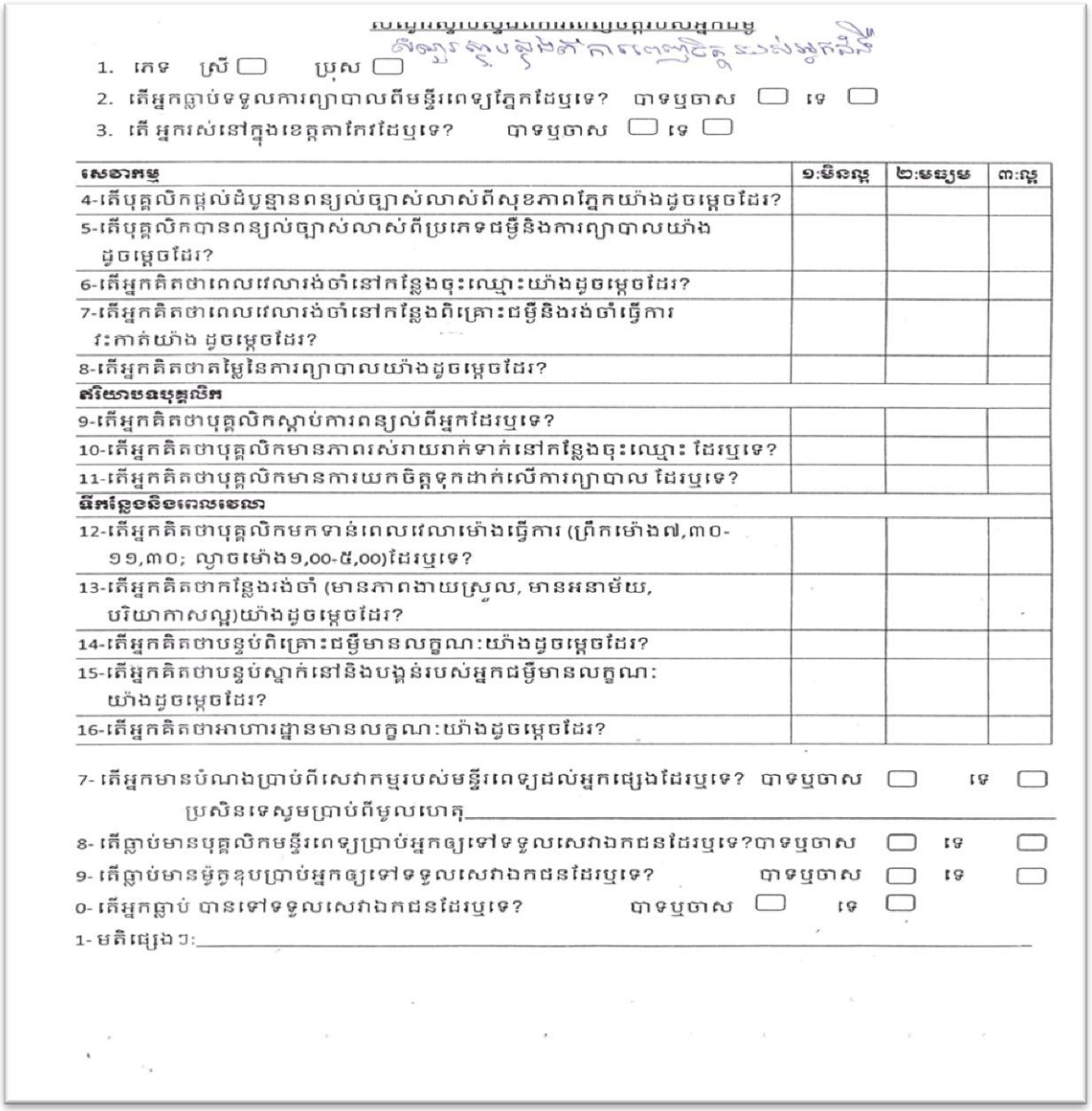
N°	Type	Fee (Riel)
1	Registration	4,000
2	Phaco	2,000,000
3	ECCE+IOLs	600,000-1,200,000
4	ECCE	400,000
5	Trabeculectomy	400,000
6	Pterygium Excision	80,000
7	Lid Surgery	120,000

Annex 8. Patients' satisfaction questionnaire of TEH

1. Sex: F/M
2. Have you ever been treated at TEH? Yes/No
3. Do you live in Takeo province? Yes/No

Service	Good	Faire	Bad
4. Do staffs advice and explain clearly about the eye health?			
5. Do staffs explain clearly about the disease and treatment?			
6. How to do think about registration waiting time?			
7. How do you think about the waiting time at OPD and OT?			
8. How do you think about the user fee?			
Staffs' attitude			
9. Do you think staffs listen to your explain?			
10. Do you think staffs are friendly at the registration place?			
11. Do you think staffs pay attention to treatment?			
Place and Time			
12. Do you think staffs arrive on time?			
13. How do you think about waiting place? (Comfortable, environment…)			
14. How do you think about OPD room?			
15. How do you think about ward and restroom?			
16. How do you think about the canteen?			
17. Do you intend to tell the other about THE? Yes/No			
18. Did any staffs use to tell you to get the private service? Yes/No			
19. Have you ever received private service? Yes/No			
Idea or suggestion:			

Annex 9: Patient's satifaction in TEH



1. ភេទ ស្រី ☐ ប្រុស ☐
2. តើអ្នកធ្លាប់ទទួលការព្យាបាលពីមន្ទីរពេទ្យភ្នែកដែរឬទេ? បាទឬចាស ☐ ទេ ☐
3. តើអ្នករស់នៅក្នុងខេត្តតាកែវដែរឬទេ? បាទឬចាស ☐ ទេ ☐

សេវាកម្ម	១:មិនល្អ	២:មធ្យម	៣:ល្អ
4-តើបុគ្គលិកផ្តល់ដំបូន្មានពន្យល់ច្បាស់លាស់ពីសុខភាពភ្នែកយ៉ាងដូចម្តេចដែរ?			
5-តើបុគ្គលិកបានពន្យល់ច្បាស់លាស់ពីប្រភេទជម្ងឺនិងការព្យាបាលយ៉ាងដូចម្តេចដែរ?			
6-តើអ្នកគិតថាពេលវេលារង់ចាំនៅកន្លែងចុះឈ្មោះយ៉ាងដូចម្តេចដែរ?			
7-តើអ្នកគិតថាពេលវេលារង់ចាំនៅកន្លែងពិគ្រោះជម្ងឺនិងរង់ចាំធ្វើការវះកាត់យ៉ាង ដូចម្តេចដែរ?			
8-តើអ្នកគិតថាតម្លៃនៃការព្យាបាលយ៉ាងដូចម្តេចដែរ?			
ឥរិយាបថបុគ្គលិក			
9-តើអ្នកគិតថាបុគ្គលិកស្តាប់ការពន្យល់ពីអ្នកដែរឬទេ?			
10-តើអ្នកគិតថាបុគ្គលិកមានភាពរស់រាយរាក់ទាក់នៅកន្លែងចុះឈ្មោះ ដែរឬទេ?			
11-តើអ្នកគិតថាបុគ្គលិកមានការយកចិត្តទុកដាក់លើការព្យាបាល ដែរឬទេ?			
ទីកន្លែងនិងពេលវេលា			
12-តើអ្នកគិតថាបុគ្គលិកមកទាន់ពេលវេលាម៉ោងធ្វើការ (ព្រឹកម៉ោង៧,៣០-១១,៣០; ល្ងាចម៉ោង១,00-៥,00)ដែរឬទេ?			
13-តើអ្នកគិតថាកន្លែងរង់ចាំ (មានភាពងាយស្រួល, មានអនាម័យ, បរិយាកាសល្អ)យ៉ាងដូចម្តេចដែរ?			
14-តើអ្នកគិតថាបន្ទប់ពិគ្រោះជម្ងឺមានលក្ខណៈយ៉ាងដូចម្តេចដែរ?			
15-តើអ្នកគិតថាបន្ទប់ស្នាក់នៅនិងបង្គន់របស់អ្នកជម្ងឺមានលក្ខណៈ: យ៉ាងដូចម្តេចដែរ?			
16-តើអ្នកគិតថាអាហារដ្ឋានមានលក្ខណៈយ៉ាងដូចម្តេចដែរ?			

7- តើអ្នកមានបំណងប្រាប់ពីសេវាកម្មរបស់មន្ទីរពេទ្យដល់អ្នកផ្សេងដែរឬទេ? បាទឬចាស ☐ ទេ ☐
ប្រសិនទេសូមប្រាប់ពីមូលហេតុ_____
8- តើធ្លាប់មានបុគ្គលិកមន្ទីរពេទ្យប្រាប់អ្នកឲ្យទៅទទួលសេវាឯកជនដែរឬទេ?បាទឬចាស ☐ ទេ ☐
9- តើធ្លាប់មានម៉ូតូឌុបប្រាប់អ្នកឲ្យទៅទទួលសេវាឯកជនដែរឬទេ? បាទឬចាស ☐ ទេ ☐
0- តើអ្នកធ្លាប់ បានទៅទទួលសេវាឯកជនដែរឬទេ? បាទឬចាស ☐ ទេ ☐
1- មតិផ្សេងៗ:_____

Annex 10. Cataract Surgical Outcome at TEH

Annual report cataract outcome

Period: 2013-Jan until 2013-Mar
Hospital/Camp = TEH
All surgeons

Date: Monday, July 01, 2013

1. Age & Gender of operated patients

	Males		Females		Total	
	N	%	N	%	N	%
20-39	1	*0.7*	4	*1.1*	5	*1.0*
40-49	6	*4.3*	9	*2.6*	15	*3.1*
50-59	25	*17.9*	49	*14.0*	74	*15.1*
60-69	42	*30.0*	126	*36.1*	168	*34.4*
70-79	46	*32.9*	136	*39.0*	182	*37.2*
80 +	20	*14.3*	25	*7.2*	45	*9.2*
Total	140	*100.0*	349	*100.0*	489	*100.0*

2. Number of first eyes and second eyes operated

	First Eye N = 363	Second Eye N = 126
Age groups	%	%
20-39	*100.0*	*0.0*
40-49	*86.7*	*13.3*
50-59	*77.0*	*23.0*
60-69	*70.2*	*29.8*
70-79	*74.2*	*25.8*
80+	*77.8*	*22.2*
Total	*74.2*	*25.8*

3. Proportion of known ocular pathology in operated eye

Pathology in operated eye	N	*% of all operations*
Corneal scar	27	*5.5*
Old iritis	1	*0.2*
Retinal disease	29	*5.9*
Glaucoma	7	*1.4*
Other pathology	1	*0.2*
Total	65	*13.3*

4. Visual acuity in the operated eye pre-op, at discharge and follow up

	Admission N= 489		1 - 3 weeks N= 382		4 - 11 weeks N= 234		12+ weeks N= 47		WHO norms on outcome	
Visual Acuity	Pre-op.	Discharge	Presenting	Best	Presenting	Best	Presenting	Best	Presenting	Best
	%	%	%	%	%	%	%	%	%	%
6/6 - 6/18 *	*1.6*	*45.4*	*50.3*	*65.2*	*51.7*	*69.7*	*46.8*	*76.6*	>80%	>90%
<6/18 - 6/60 *	*35.2*	*46.8*	*41.1*	*28.5*	*39.7*	*25.2*	*51.1*	*21.3*	<15%	<5%
<6/60 ***	*63.2*	*7.8*	*8.6*	*6.3*	*8.5*	*5.1*	*2.1*	*2.1*	<5%	<5%

* is equal to 20/20 - 20/60; 1.00 - 0.33 (decimal); 0.0 - 0.48 (Log MAR)

** is equal to <20/60 - 20/200; <0.33 - 0.10 (decimal); >0.48 - 1.0 (Log MAR)

*** is equal to <20/200; <0.10 (decimal); >1.0 (Log MAR)

Presenting = Presenting VA in the operated eye with available correction

Best = Best VA in operated eye, with full refraction or pinhole

Annex 10.1: Cataract surgical outcome at TEH

Annual report cataract outcome

Period: 2013-Jan until 2013-Mar
Hospital/Camp = TEH
All surgeons

Date: Monday, July 01, 2013

5. Visual acuity in the better eye pre-op, at discharge and follow up

	Admission N= 489		1 - 3 weeks N= 382		4 - 11 weeks N= 234		12+ weeks N= 47	
Visual Acuity	Pre-op. %	Discharge %	Presenting %	Best %	Presenting %	Best %	Presenting %	Best %
6/6 - 6/18 *	30.9	71.8	63.4	73.6	62.8	77.4	51.1	76.6
<6/18 - 6/60 **	41.5	24.9	34.0	24.6	33.8	20.9	46.8	21.3
<6/60 ***	27.6	3.3	2.6	1.8	3.4	1.7	2.1	2.1

* is equal to 20/20 - 20/60; 1.00 - 0.33 (decimal); 0.0 - 0.48 (Log MAR)
** is equal to <20/60 - 20/200; <0.33 - 0.10 (decimal); >0.48 - 1.0 (Log MAR)
*** is equal to <20/200; <0.10 (decimal); >1.0 (Log MAR)
Presenting = Presenting VA in the better eye with available correction
Best = Best VA in better eye, with full refraction or pinhole

6. Good / borderline / poor outcome at discharge by month (presenting VA)

Year & Month	Total operations N	Good N	Good %	Borderline N	Borderline %	Poor N	Poor %	No data N	No data %
2013-Jan	180	74	41.1	87	48.3	19	10.6	0	0.0
2013-Feb	146	74	50.7	61	41.8	11	7.5	0	0.0
2013-Mar	163	74	45.4	81	49.7	8	4.9	0	0.0
Total	**489**	**222**	***45.4***	**229**	***46.8***	**38**	***7.8***	**0**	***0.0***

7. Proportion of good / borderline / poor outcome by follow-up (presenting VA)

	Total ops. N	Good N	Good %	Borderline N	Borderline %	Poor N	Poor %	No data N	No data %
Discharge	489	222	45,4	229	46.8	38	7.8	0	0.0
1 - 3 weeks	382	192	50,3	157	41.1	33	8.6	107	21.9
4 - 11 weeks	234	121	51,7	93	39.7	20	8.5	255	52.1
12+ weeks	47	22	46,8	24	51.1	1	2.1	442	90.4
WHO norm:			**>80%**		**<15%**		**<5%**		

Annex10.2: Cataract surgical outcome at TEH

Annual report cataract outcome

Period: 2013-Jan until 2013-Mar
Hospital/Camp = TEH
All surgeons

Date: Monday, July 01, 2013

8. Operative complications

Year & month	Total operated cases	Total complicated cases		Capsule rupture without vitreous loss		Vitreous loss		Zonular dehiscence		Retained lens matter		Wound leak		Striate kerato-pathy		Endoph-thal-mitis		Other compl.	
	N	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
2013-Jan	180	9	5.0	1	11.1	4	44.4	0	0.0	0	0.0	0	0.0	0	0.0	1	11.1	3	33.3
2013-Feb	146	7	4.8	0	0.0	3	42.9	2	28.6	0	0.0	0	0.0	0	0.0	1	14.3	1	14.3
2013-Mar	163	4	2.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	25.0	2	50.0	1	25.0
Total	489	20	4.1	1	0.2	7	1.4	2	0.4	0	0.0	0	0.0	1	0.2	4	0.8	5	1.0

Percentage of complications should be less than 10% of all operations

9. Operative complications by place of surgery

	Base hospital. N= 489		Other hospital N= 0		Out of hospital N= 0	
	n	% of total ops.	n	% of total ops.	n	% of total ops.
Capsule rupture without vitreous loss	1	0.2	0	0.0	0	0.0
Vitreous loss	7	1.4	0	0.0	0	0.0
Zonular dehiscence	2	0.4	0	0.0	0	0.0
Striate keratopathy	1	0.2	0	0.0	0	0.0
Endophthalmitis	4	0.8	0	0.0	0	0.0
Others	5	1.0	0	0.0	0	0.0
Retained lens matter	0	0.0	0	0.0	0	0.0
Wound leak	0	0.0	0	0.0	0	0.0
Total	20	4.1	0	0.0	0	0.0

Percentage of complications should be less than 10% of all operations

10. Operative complications by cadre of surgeons

	Consultant N= 400		Trainee N= 89		Non-doctor N= 0	
	n	% of total ops.	n	% of total ops.	n	% of total ops.
Capsule rupture without vitreous loss	1	0.3	0	0.0	0	0.0
Vitreous loss	3	0.8	4	4.5	0	0.0
Zonular dehiscence	2	0.5	0	0.0	0	0.0
Striate keratopathy	0	0.0	1	1.1	0	0.0
Endophthalmitis	3	0.8	1	1.1	0	0.0
Others	2	0.5	3	3.4	0	0.0
Retained lens matter	0	0.0	0	0.0	0	0.0
Wound leak	0	0.0	0	0.0	0	0.0
Total	11	2.8	9	10.1	0	0.0

Percentage of complications should be less than 10% of all operations

Annex 10.3: Cataract surgical outcome at TEH

Annual report cataract outcome

Period: 2013-Jan until 2013-Mar
Hospital/Camp = TEH
All surgeons

Date: Monday, July 01, 2013

11. Operative complications by additional ocular pathology

	Corneal scar N= 27		Old iritis N= 1		Retinal disease N= 29		Glaucoma N= 7		Others N= 1	
	n	*% total ops.*	n	*% total ops.*	n	*% total ops.*	n	*% total ops.*	n	*% total ops.*
Capsule rupture without vitreous loss	1	*3.7*	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*
Vitreous loss	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*
Zonular dehiscence	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*
Striate keratopathy	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*
Endophthalmitis	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*
Others	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*
Retained lens matter	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*
Wound leak	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*
Total	1	*3.7*	0	*0.0*	0	*0.0*	0	*0.0*	0	*0.0*

12. Operative complications by type of surgery and IOL

	Total operated cases	Total compl. cases		Capsule rupture without vitreous loss	Vitreous loss	Zonular dehiscence	Retained lens matter	Wound leak	Striate kerato-pathy	Endoph-thal-mitis	Others
	N	N	%	N	N	N	N	N	N	N	N
ICCE + AC-IOL	0	0	*0.0*	0	0	0	0	0	0	0	0
ICCE + No-IOL	0	0	*0.0*	0	0	0	0	0	0	0	0
ECCE + PC-IOL	27	5	*18.5*	0	2	0	0	0	0	0	3
ECCE + AC-IOL	0	0	*0.0*	0	0	0	0	0	0	0	0
ECCE + No-IOL	0	0	*0.0*	0	0	0	0	0	0	0	0
SICS + PC-IOL	453	15	*3.3*	1	5	2	0	0	1	4	2
SICS + AC-IOL	0	0	*0.0*	0	0	0	0	0	0	0	0
SICS + No-IOL	3	0	*0.0*	0	0	0	0	0	0	0	0
Phaco + PC-IOL	6	0	*0.0*	0	0	0	0	0	0	0	0
Phaco + AC-IOL	0	0	*0.0*	0	0	0	0	0	0	0	0
Phaco + No-IOL	0	0	*0.0*	0	0	0	0	0	0	0	0
Total	489	20	*4.1*	1	7	2	0	0	1	4	5

13. Causes of poor outcome at discharge and follow up

	Total		Selection		Surgery		Spectacles		Sequelae	
	N	*% of all ops.*	N	*% poor outcome*	N	*% poor outcome*	N	*% poor outcome*	N	*% poor outcome*
Discharge	38	*7.8*	28	*73.7*	10	*26.3*	0	*0.0*	0	*0.0*
1 - 3 weeks	33	*6.7*	24	*72.7*	7	*21.2*	0	*0.0*	2	*6.1*
4 - 11 weeks	20	*4.1*	13	*65.0*	6	*30.0*	0	*0.0*	1	*5.0*
12+ weeks	1	*0.2*	1	*100.0*	0	*0.0*	0	*0.0*	0	*0.0*

Annex10.4: Cataract surgical outcome at TEH

Annual report cataract outcome

Period: 2013-Jan until 2013-Mar
Hospital/Camp = TEH
All surgeons

Date: Monday, July 01, 2013

14. Percentage of POOR visual outcome at discharge and follow up

	Discharge			4 weeks or more follow-up		
	Total ops.	No. ops. **< 6/60**	*% ops. < 6/60*	**All FU ops.**	FU ops. **< 6/60**	*% ops. < 6/60*
All operated eyes	**489**	**38**	*7.8*	**248**	**17**	*6.9*
Total at base hospital	**489**	**38**	*7.8*	**248**	**17**	*6.9*
ICCE + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ICCE + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ECCE + PC-IOL	**27**	**3**	*11.1*	**19**	**1**	*5.3*
ECCE + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ECCE + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
SICS + PC-IOL	**453**	**32**	*7.1*	**225**	**15**	*6.7*
SICS + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
SICS + No-IOL	**3**	**2**	*66.7*	**2**	**1**	*50.0*
Phaco + PC-IOL	**6**	**1**	*16.7*	**2**	**0**	*0.0*
Phaco + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
Phaco + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
Total at other hospital	**0**	**0**		**0**	**0**	
ICCE + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ICCE + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ECCE + PC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ECCE + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ECCE + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
SICS + PC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
SICS + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
SICS + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
Phaco + PC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
Phaco + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
Phaco + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
Total out of hospital	**0**	**0**		**0**	**0**	
ICCE + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ICCE + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ECCE + PC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ECCE + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
ECCE + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
SICS + PC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
SICS + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
SICS + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
Phaco + PC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
Phaco + AC-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
Phaco + No-IOL	**0**	**0**	*0.0*	**0**	**0**	*0.0*
All PC-IOL	**486**	**36**	*7.4*	**246**	**16**	*6.5*
All AC-IOL	**0**	**0**		**0**	**0**	
All No IOL	**3**	**2**	*66.7*	**2**	**1**	*50.0*

* 0 - 5% VA <6/60 OR <20/200; <0.10 (decimal); >1.0 (Log MAR): GOOD outcome
5 - 10% VA <6/60 OR <20/200; <0.10 (decimal); >1.0 (Log MAR): BORDERLINE outcome: Scope for improvement
>10% VA <6/60 OR <20/200; <0.10 (decimal); >1.0 (Log MAR): POOR outcome: find causes of poor outcome

Annex 11. Service Packages of Ophthalmology and Blindness Prevention for Referral Hospital (CPA)

CPA 1	CPA 2	CPA 3
1. Active Trachoma	1. Active Trachoma	1. Active Trachoma
2. Community Ophthalmology	2. Community Ophthalmology	2. Community Ophthalmology
3. Disorder of Conjunctiva	3. Disorder of Conjunctiva	3. Disorder of Conjunctiva
4. Inflammation of Eyelid	4. Inflammation of Eyelid	4. Inflammation of Eyelid
5. Red Eye	5. Red Eye	5. Red Eye
	6. Corneal Diseases	6. Corneal Diseases
	7. Cataract	7. Cataract
	8. Glaucoma	8. Glaucoma
	9. Eye Injuries	9. Eye Injuries
		10. Dacryocystitis
		11. Diabetic Retinopathy
		12. Dry Eye
		13. Endophthalmitis
		14. Evisceration/Enucleation
		15. Keratopathy
		16. Lid Surgery
		17. Pterygium
		18. Refractive Errors
		19. Retina Surgery
		20. Strabismus
		21. Uveitis

Table1. Health Facilities Establishment Criteria

Criteria	(1) Population	(2) Accessibility
Health Center (HC) MPA	Optimal: 10,000 Vary: 8,000-12,000	Radius: 10 km or Max. 2 hrs walk
Referral Hospital (RH) CPA	Optimal: 100,000-200,000 Vary: 60,000-200,000	20-30 km between 2 RHs or Max. 3 hrs by car/boat

Table2. TEH Patient Consultation Categorized by Location

	2011	
Location	**Total**	**%**
Takeo	18,313	63%
Daunkeo	1,261	4%
Angkor Borei	925	3%
Tramkak	3,838	13%
Treang	2,257	8%
Samrong	3,056	11%
Kirivong	1,041	4%
KohAndet	601	2%
Prey Kabas	1,898	7%
BoreyJulsa	363	1%
Bati	3,073	11%
Kampot	2,995	10%
Kg. Speu	1,963	7%
Other Province	5,708	20%
Total	288,979	

Annex 12. Essential Medicines List 2012

N⁰	Description	Strength	Form	MPA	CPA1	CPA2	CPA3	Therapeutic category
			Eye Unit Program					
1	Acetazolamide	250mg	Tab	/	/	/	*	Opth. Anti-glaucoma
2	Atropine Sulphat 1% eye drop	5ml	Vial	/	/	/	*	Opth. With mydriatic
3	Ciprofloxacine 0.3% eye drop	5ml	Vial	/	/	SN	*	Opth. Anti-infective
4	Fluoresceine 2 % eye drop	10ml	Vial	/	/	/	*	Opht. Diagnostic
5	Neomycine + Polymycine B + Dexamethasone, eye drop (Maxidrol eye drop) 5 ml		Vial	/	/	/	*	Opth. Anti-infective/anti-inflammatory
6	Pilocarpine (as sodium phosphate) 2 % eye drop	5ml	Vial	/	/	/	*	Opth. With miotic
7	Prednisolone Acetate 1 % eye drop	5ml	Vial	/	/	/	*	Opth. Anti-allergic
8	Tetracaine eye drop 5 ml	0.5%	Vial	/	/	/	*	Opth. Anti-infective
9	Tetracycline 1 % eye ointment	5g	Tube	*	*	*	*	Opth. Anti-infective
10	Tomolol eye drop 3 ml	0.5%	Vial	/	/	/	*	Opth. Mitotic
11	Tropicamide 1% eye drop	10ml	Vial	/	/	/	*	Opth. diagnostic
12	Viscoelastic solution (Syringe 1 ml)	1ml	syringe	/	/	/	*	Steril clear visco solution with elastic property used in cataract, glaucoma and corneal ophthalmic surgery procedure

Annex 13. Statistic Report of MoH which included Eye Care 2012

Diseases	0_4Yrs		5_14Yrs		15_49Yrs		≥50Yrs		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Eyes Diseases	1	0	7	0	31	0	19	0	58	0
Cataract	9	0	111	0	1,153	0	6,471	0	7,744	0
Trachoma	0	0	2	0	47	0	105	0	154	0
Cornea Ulcer	2	0	5	0	116	0	80	0	203	0
Glaucoma	4	0	4	0	33	0	125	0	166	0
Goiter	0	0	121	0	835	1	323	3	1,279	4
Substance abuse	0	0	0	0	53	0	11	0	64	0
Mental Health	55	0	81	0	2,369	4	661	1	3,166	5
Marasmus/Kwashiorhor	1,315	61	37	1	0	0	0	0	1,352	62
Meningo-Encephalitis Non Tubercular	786	50	680	36	574	73	230	20	2,270	179
Acute Jaundice	131	0	10	0	59	2	27	0	227	2
Rabies	1	0	2	1	3	0	2	0	8	1
AIDS(Clinic)	333	5	211	8	2,651	156	334	22	3,529	191
Heart Disease	1,422	15	324	12	1,544	112	1,952	111	5,242	250
Diabetes	13	0	23	1	629	17	1,680	37	2,345	55
Delivery	0	0	199	0	84,754	21	77	1	85,030	22
Gynecological Pathology	2	0	110	0	11,180	7	667	1	11,959	8
Spontaneous Abortion	0	0	14	0	3,454	1	1	0	3,469	1
Induced Abortion	0	0	8	0	2,586	0	5	0	2,599	0
Hep-B	2	0	26	0	281	10	246	9	555	19
Breast Cancer	0	0	0	0	126	0	57	0	183	0
Lung Cancer	0	0	0	0	46	7	140	15	186	22
Liver Cancer	0	0	1	0	131	7	203	15	335	22
Cervix Cancer	0	0	0	0	191	6	163	0	354	6
Uterus Cancer	0	0	0	0	59	0	8	0	67	0
Schistosomiasis	7	0	8	0	46	0	25	0	86	0
Other problems	35,669	1,225	24,166	170	82,619	1,241	34,465	876	201,651	3,512
Whole Country	*141,735*	*1,840*	*73,914*	*339*	*275,180*	*2,734*	*84,329*	*2,007*	*575,158*	*6,920*