The Second Report of the National Eye Database 2008

Includes reports on:

Cataract Surgery Registry 2002,2003,2004, 2007 and 2008

Diabetic Eye Registry 2007, 2008

Contact Lens Related Corneal Ulcer 2007, 2008

Age-related Macular Degeneration Registry 2008

Retinoblastoma Registry 2008

Ophthalmology Service Census 2002 to 2008

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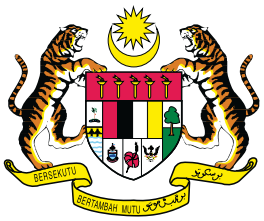

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NED Steering Committee Members
Jan 2010

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ABOUT NATIONAL EYE DATABASE

Introduction

The National Eye Database (NED) is an eye health information system supported by MOH. It is a clinical database consisting of six patient registries and a monthly ophthalmology service census. The patient registries are Cataract Surgery Registry, Diabetic Eye Registry, Contact Lens-Related Corneal Ulcer Surveillance, Glaucoma Registry, Retinoblastoma Registry, and Age Related Macular Degeneration Registry. The source data producers are eye care providers, currently from the public. Information collected, both clinical and epidemiological, are very useful in assisting the MOH, Non-Governmental Organizations, private healthcare providers and industry in the planning, evaluation and continuous improvement of eye care services, leading to prevention and control of blindness in the nation.

Vision

An accessible eye health information.

General Objectives of the National Eye Databases

1. To establish and maintain a web based eye health information system on natural history of visual threatening eye diseases, which are of public health importance. The information is useful in the planning and evaluation of eye care service.

2. To determine the effectiveness of treatment, both clinical outcomes and cost, and to identify factors influencing outcomes. This serves the needs of outcome assessment.

3. To provide information necessary to evaluate ophthalmology services through census and key performance indicators, as well as on safety or harm of products and services used in the treatment of a disease. This contributes to continuous quality initiative.

4. To evaluate the accessibility and equity in health care provision. This information enhances accountability.

5. To provide a mean of prompt and wide dissemination of epidemiological and clinical information through web such as real time registries reports and notification of epidemic of contact lens-related corneal ulcer. This is essential for public health advocacy.

6. To stimulate and facilitate research on eye diseases.

Specific Objective of Individual Registry and Census

Cataract Surgery Registry

The Cataract Surgery Registry (CSR) was initiated in 2002 and collects data pertaining to patients who have had cataract surgery. Data collected include demography, medical history, operative events, post-operative visual outcomes and probable causes for poor outcome. Since 2008, data on posterior capsular rupture, visual outcome and post-operative endophthalmitis were linked to online key performance indicator for monitoring centre performance while data on incidence of posterior capsular rupture and patients with poor visual outcome are linked to online cumulative sum (CUSUM) to monitor competency of individual surgeon. Annual reports for the year 2002, 2003, 2004 and 2007 are available at www.acrm.org.my/ned, under the section of publication.

Specific Objectives

1. To determine the frequency, distribution and practice pattern of cataract surgery in Malaysia.
2. To determine the outcomes and factors influencing outcomes of cataract surgery.
3. To evaluate cataract surgery services based on rate of posterior capsular rupture, post-operative infection, post-operative visual outcome and induced astigmatism.
4. To stimulate and facilitate research on cataract and its management.

Diabetic Eye Registry

Diabetic eye registry collects data on patients who are seen for the first time at MOH ophthalmology clinics and some optometry clinics at hospitals without ophthalmologists. All MOH ophthalmology clinics participated in 2007 and 2008. From 2009 onwards, participation is optional.

Specific Objective

1. To evaluate the status of diabetic retinopathy at the first diabetic eye screening at Ophthalmology clinics.

Contact Lens-Related Corneal Ulcer Surveillance

Contact lens-related corneal ulcer surveillance was initiated in 2007 following the global outbreak of fusarium keratitis related to contact lens cleaning solution in 2006. Surveillance for the years 2007 and 2008 only cover MOH ophthalmology clinics and the findings were similar for both the years. Therefore, unless private and university ophthalmology clinics also take part in this active surveillance, the findings will not be comprehensive. Thus the surveillance will stay dormant from 2009 onwards. The web application can be activated when necessary in the future.

Specific Objectives

1. To detect outbreak of contact lens-related corneal ulcer.
2. To determine pattern of causative organism of corneal ulcer.
3. To study the characteristics of patients in terms of demography, risk factors and contact lens type and wearing patterns.
4. To monitor the outcome of patients with contact lens related corneal ulcer.

Glaucoma Registry

Glaucoma registry captures data on patient demography, types of glaucoma, risk factors and mode of management. The participation to this registry is optional.

Specific Objectives

1. To study the demographic characteristics of glaucoma patients, glaucoma suspects and patients with ocular hypertension.
2. To determine the types of glaucoma.
3. To assess risk factors associated with glaucoma, glaucoma suspects and patients with ocular hypertension.
4. To evaluate the pattern of management among glaucoma patients.

Retinoblastoma Registry
Retinoblastoma registry collects data on the pattern of clinical presentation, mode of treatment and outcome of patients with retinoblastoma seen at ophthalmology clinics with paediatric ophthalmology service. The main SDP is Hospital Kuala Lumpur.

Specific Objectives

1. To determine the incidence and distribution of retinoblastoma in different states in Malaysia.
2. To determine the ethnic-specific prevalence of retinoblastoma in Malaysia.
3. To study characteristics of RB patients in terms of clinical presentation and stage of disease based on International Intraocular Retinoblastoma Classification.
4. To evaluate types of treatments and monitor treatment trends.
5. To evaluate treatment outcomes including complications related to treatment.

Age Related Macular Degeneration Registry
Age Related Macular Degeneration (AMD) registry collects data on demographics, risk factors, clinical features and methods of treatment used in newly diagnosed patients with AMD. Hospital Selayang is the only SDP in 2008.

Specific Objectives

1. To determine patients' characteristics, risk factors and clinical presentation of AMD.
2. To study types of AMD based on clinical and investigative examinations.
3. To evaluate quality of life among AMD patients.
4. To evaluate types of treatments given to patients.

Monthly Ophthalmology Service Census

Since 2002, Ophthalmology Service of MOH has been collecting annual census from all the hospitals with ophthalmology departments. Data include essential service census and key performance indicators for ophthalmology service. There are 13 sections in the census return, namely out-patients, inpatients, major eye operations, cataract service, diabetic service, glaucoma service, and optometry service, and subspecialty services which include vitreoretinal, corneal, paediatric ophthalmology, oculoplasty, medical retinal, and a public health ophthalmology, and data on training records and prevention of blindness activities. Data are entered monthly by staff at sites via on-line data entry. Heads of ophthalmology department can view their own and other hospitals' real-time reports.

Specific Objectives

1. To evaluate service output in all ophthalmology departments.
2. To study trends in service output and service patterns.
3. To get baseline and norm from services provided by MOH ophthalmology departments.
4. To determine norm and set standards for performance indicators for centres which differ in strength of physical and human resources.

Cusum- Ophthalmology

Cataract surgery is the most common procedure done in ophthalmology departments. The procedure is quite consistent and outcome is measured by visual acuity. Cataract surgery outcome depends greatly on surgeons' skill. With advancement in technology and intraocular lens implantation, good visual outcome is almost certain among patients without pre-existing ocular co-morbidity. Hence, monitoring and evaluating surgeons' competency, especially trainees' performance, are essential in ensuring standard of care.

Cumulative Sum (CUSUM) software auto-mine data on occurrence of posterior capsular rupture and patients with post-operative vision worse then 6/12 from cataract surgery registry on surgery done by individual surgeon using unique surgeon ID. From 2008, by using individual unique username and password, surgeon can access his/her own CUSUM charts via eCUSUM web page. Consultant ophthalmologists can view their own as well as their trainees' charts. By doing so, monitoring on surgeons' competency in cataract surgery is made most effectively and easily.

Key Performance Indicator

The Ministry of Health (MOH) launched the implementation of Key Performance Indicators (KPIs) in February 2008 with the aim to assess the overall performance of services provided by Clinical Departments in MOH. The MOH Ophthalmology Service has identified eight KPIs which measure clinical performance of core ophthalmology service such as out-patient service, cataract surgery and diabetic eye screening.

Key Performance Indicators related to cataract surgery such as rate of infectious endophthalmitis following cataract surgery, posterior capsular rupture and postoperative visual acuity better than 6/12 in patients without ocular co-morbidity are data mined from cataract surgery registry.

Ophthalmology Service KPIs:

Aspect of Performance : QUALITY & SAFETY		
Dimension : Patient-focused Care		**Optimal Target / Standard**
No. 1	Waiting time to see a doctor at the Specialist Clinic	> 90% of the patients are seen within ninety (90) minutes
No. 2	Waiting Time to get an appointment for First Consultation for Diabetic Patients at the Specialist Clinic	> 80% of the patients are given an appointment for First Consultation within 6 weeks
No. 3	Waiting Time for Cataract Surgery	> 80% of patients have appointment given for cataract surgery within 16 weeks
Dimension : Clinical Effectiveness & Risk Management		
No. 4	Rate of Infectious Endophthalmitis following Cataract Surgery	< 0.2% (2 cases per 1000 operations)
No. 5	Rate of Posterior Capsular Rupture during Cataract Surgery	< 5 % (50 cases per 1000 operations)
No. 6	Rate of Post-operative Visual Acuity of 6/12 or better within 3 months following Cataract Surgery in Patients without Ocular Co-morbidity	> 85 % (850 cases per 1000 operations)*
No. 7	Average Frequency of Mortality / Morbidity Review being Conducted in Ophthalmology Department Monthly	At least 6 times in 6 months
Aspect Of Performance : PRODUCTIVITY		
Dimension : Workload		
No. 8	Percentage of Out-patients seen by Specialist in specialist clinic per Month	To be decided

In 2009, we added two new features i.e. interactive online charting and intraocular lens (IOL) defect notification. The interactive online charting allows public users to identify findings they want to display in tables. While IOL defect notification acts as a mean for all public and private eye care providers to notify IOL defect, an initiative to promote patient safety.

Methods of the National Eye Database

The National Eye Database is designed as a cohort study. It is an online clinical database hosted at the Association of Clinical Registry Malaysia website at www.acrm.org.my/ned. Its protocol was approved by the Medical Research Ethical Committee of MOH on 2nd September 2008 (reference number NMRR 08-552-1707) and is accessible at the NED website.

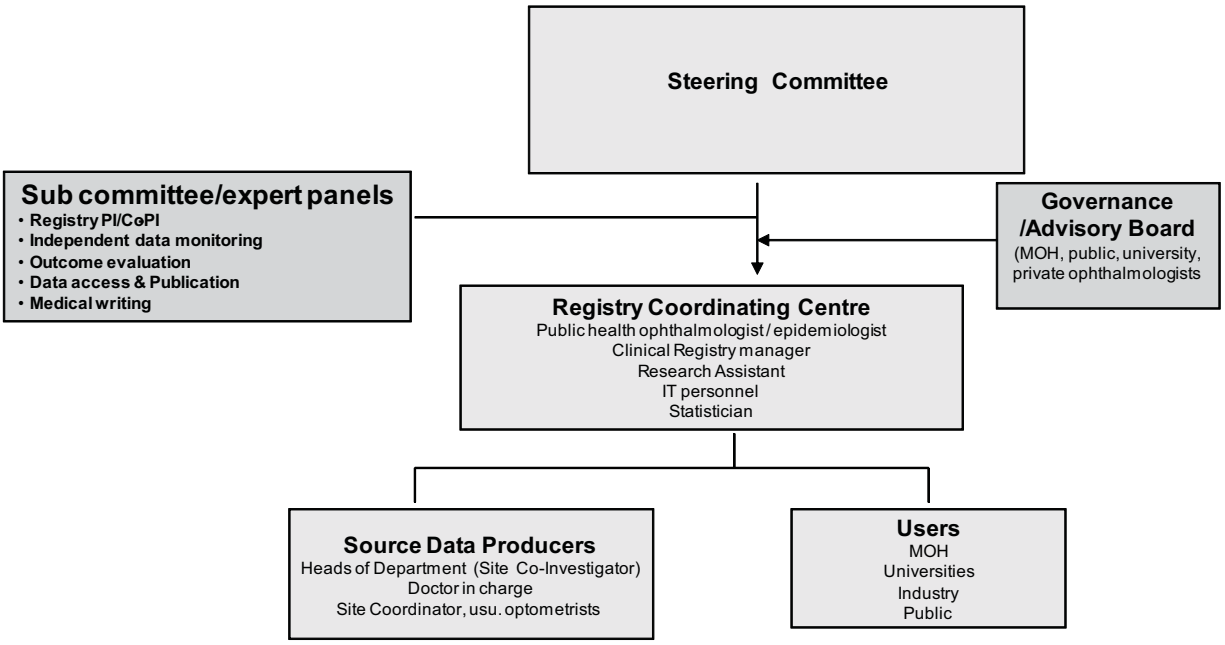
Data collection and data entry are done at SDP sites. Data are collected either using case report forms (CRF) (refer to appendix), which are later entered into the web application, or are directly entered into the web application during the course of clinical work.

Data management using data query are set in the web application to reduce inconsistency, out-of-range or missing values. Authorised staff at each SDP are given passwords to perform data entry. Individual SDP reports and aggregated reports based on cumulative data of all SDPs are available real-time at NED website. These reports are only accessible by heads of department, doctors-in-charge and site coordinators via authorised password. The web reports are descriptive analysis of data which have been entered. Annual statistical report will be produced based on data collected for a specific year. The statistical reports will be published yearly and distributed to users in MOH divisions and units, all the ophthalmology departments, universities, other relevant public agencies and non-governmental organisations.

The NED has high level of security for protection of its data. Data protection is ensured at all times through strict compliance with regulatory requirements such as authentications of users and web application owners, access control, encryption, audit trail, control of external communication links and access, as well as system backup and disaster recovery.

NED Organization

Organisation Chart



NED SOURCE DATA PROVIDERS

List of doctors in charge & site coordinators for 2008-2009

Northern Zone			
No.	**SDP**	**Doctor-in-charge**	**Site Coordinator**
1.	Hospital Kangar	Dr Noram Azian bin Ramli	Roslinda bt Rahman
2.	Hospital Sultanah Bahiyah	Dr Lee Annie	Nur Diana Mohd Zani
3.	Hospital Sungai Petani	Dr Rosnita binti Alias	Juliana Md Desa
4.	Hospital Pulau Pinang	Dr Ang Ee Ling	Noor Asmah Md Azmi
5.	Hospital Bukit Mertajam	Dr Ng Seok Hui	Maria Mohamad Muhayadin
6.	Hospital Ipoh	Dr Poh Eu Ping	Noraini Harith
7.	Hospital Taiping	Dr Ng Sok Lin	Rohaiza bt Abdul Hamid
8.	Hospital Teluk Intan	Dr Noram bt Mat Saad	Adawiyah Ismail
9.	Hospital Sri Manjung	Dr Yushaniza Yaacob	Juhaida bt Zahri
Central Zone			
No.	**SDP**	**Doctor-in-charge**	**Site Coordinator**
10.	Hospital Selayang	Dr Shelina Oli Mohamed	Nurul Aini Yusoff
11.	Hospital Kuala Lumpur	Dr Rohanah Alias	Intan Khusiah Abd Rahman
12.	Hospital Tengku Ampuan Rahimah	Dr Haireen Kamaruddin	Najihah Muhammad Sharif
13.	Hospital Putrajaya	Dr Salmah Othman	Lily Muhanifa Mustafa
14.	Hospital Serdang	Dr Zaida Mohd Kasim	Yusrina Mohamat Hata
15.	Hospital Sungai Buloh	Dr Shamala Retnasabapathy	Puan Majidah Zainal Abidin
16.	Hospital Ampang	Dr Zalifa Zakiah bt Asnir	Noriah binti Abdullah
Southern Zone			
No	**SDP**	**Doctor in charge**	**Site Coordinator**
17.	Hospital Tuanku Jaafar	Dr Norlelawati Abu	Normalisa Muhammad Som
18.	Hospital Tuanku Ampuan Najihah Kuala Pilah	Dr Khairul Husnaini binti Mohd Khalid	Fadhilah Mohd Hilmi
19.	Hospital Melaka	Dr Juliana Jalaluddin	Eryanti Md Omar
20.	Hospital Sultanah Aminah	Dr Kevin Ong	Nurazilah Ismail
21.	Hospital Pakar Sultanah Fatimah	Dr Ngim You Siang	Roziana Sumardi
22.	Hospital Batu Pahat	Dr Jawiah bt Hassan	Nur Adilah Abdullah
23	Hospital Sultan Ismail	Dr Hooi Siew Tong	Puan Nursalinah bt Adam

24	Hospital Tengku Ampuan Afzan	Dr. Mohamad Aziz Husni	Noor Azhari bin Ahmad
25.	Hospital Temerloh	Dr Thevi Thanigasalam	Nor Hanim Ahmad Adnan
26.	Hospital Kuala Terengganu	Dr Nor Anita Che Omar	Noor Hayati Mohammad
27.	Hospital Kota Bharu	Dr Azma Azalina Ahmad Alwi	Rossaidah bt Mustapa
28.	Hospital Kuala Krai	Dr Salazahrin Salleh	Farawahida Fakaruddin
East Malaysia Zone –Sarawak			
No	**SDP**	**Doctor-in-charge**	**Site Coordinator**
29.	Hospital Umum Sarawak	Dr Mohd Aziz Salowi	Nazirin bin Arshad
30.	Hospital Sibu	Dr Peter Chong	Suzzana Abdul Karim
31.	Hospital Bintulu	Dr KM Reddy	Nurulain Mat Zain
32.	Hospital Miri	Dr Chieng Lee Ling	Nur Hafizah Mat Jalil
East Malaysia Zone –Sabah			
No	**SDP**	**Doctor-in-charge**	**Site Coordinator**
33.	Hospital Queen Elizabeth	Dr Shuaibah Ab Ghani	Iramayanah Ambo Mase
34.	Hospital Duchess Of Kent	Dr Suriana Suaibun	Norhafizah Abd Razik
35.	Hospital Tawau	Dr Ajit Majumder	Nurliyana binti Ishak
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FOREWORD

The National Eye Database (NED) web application established in 2007, is now in its fourth year. The Malaysian Society of Ophthalmology is now a co-sponsor, together with the ophthalmology service of MOH. The NED also receives financial support from Pfizer, Novartis, Allergan and Alcon Laboratories Sdn Bhd.

This second annual report contains report of cataract surgery registry (CSR) from 2002 to 2008, diabetic eye registry 2008-2009, contact lens-related corneal ulcer surveillance 2008-2009, glaucoma registry 2008-2009, ophthalmology service census 2002-2008, and reports of two new registries, i.e. age-related macular degeneration and retinoblastoma registry.

Over the years, we see an increased level of ascertainment for cataract surgery registry, based on the number of cataract surgeries recorded in the service census. Source data producers can access real-time reports for all the data entered for their hospitals as well as the aggregated reports.

From 2009, we have incorporated the ophthalmology service key performance indicator (KPI) into the web application. Out of the eight KPIs, we are able to mine data from CSR of the three KPIs that are related to cataract surgery, which means we will save time and effort in data collection. The other new features in 2009 include interactive online charting and IOL defect notification.

There are many challenges faced by NED. To overcome these challenges, we need the leadership and commitment of head of departments (HOD) to lead their staff to work towards the success of NED. The following are the challenges we faced and the actions we need to take:-

1. Ascertainment rate for cataract surgery- HODs need to ensure their staff enter data of all the patients who have had cataract surgeries into the CSR, since data from CSR are used for competency monitoring through CUSUM and also for calculation of department KPI.
2. Data quality- staff in-charge of NED should ensure case report forms are completely filled, i.e. no missing values, and ensure data are accurate as stated in the definition of data which falls within the range of variables.
3. Prompt data entry, especially for the outcome of cataract surgery and service census.
4. Use of report- real-time report from service census, eKPI and cataract surgery registry can be used for department audit and planning.
5. Review eCUSUM chart- Head of department should review trainee's CUSUM charts for the purpose of competency monitoring.
6. Maintenance of web application- we need to seek financial support from professional bodies and industry.

   As data collected for contact lens-related corneal ulcer surveillance, diabetic eye registry and glaucoma registry for 2007 and 2008 show consistent trends, we have stopped data entry from 2009 onwards.

The future of NED is challenging. Research assistants at some state hospitals had to be terminated due to lack of funds, and with a reduction in research grant allocation, NED needs commitment and support from all relevant stakeholders.

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ABBREVIATION

ADED	Advanced Diabetic Eye Disease	NED	National Eye Database
AMD	Age related Macular Degeneration	NPDR	Non Proliferative Diabetic Retinopathy
CAI	Carbonic Anhydrase Inhibitor	NPL	No Perception Of Light
CF	Counting Finger	OT	Operating Theatre
CLRCU	Contact Lens-Related Corneal Ulcer	PCO	Posterior Capsule Opacification
CSMO	Clinically Significant Macular Odema	PCR	Posterior Capsule Rapture
CMO	Cystoid Macular Oedema	PDR	Proliferative Diabetic Retinopathy
CSR	Cataract Surgery Registry	Phaco	Phacoemulsification
DER	Diabetic Eye Registry	PL	Perception Of Light
DM	Diabetes Mellitus	PI	Principal Investigator
DR	Diabetic Retinopathy	RB	Retinoblastoma
ECCE	Extracapsular Cataract Extraction	RCC	Registry Coordinating Centre
FU	Follow Up	SD	Standard Division
HM	Hand Movement	SDP	Source Data Producers
HPT	Hypertension	VA	Visual Acuity
ICCE	Intracapsular Cataract Extraction	VR	Vitreoretinal Surgery
IOL	Intraocular Lens	ZD	Zonular Dialysis
MOH	Ministry Of Health		

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CATARACT SURGERY REGISTRY

1. Stock and Flow

- Number of SDP increased from 25 SDPs in 2002 to 36 SDPs in 2008.
- Total number of cataract surgery registered to CSR increased from 12798 in 2002 to 21496 in 2008.
- CSR ascertainment rates for MOH SDP, calculated based on census return were maintained above 80.0% (84.6% in 2008).
- More than 80% of cataract surgeries registered had outcome data except for the year 2004 (only 33.9%).

2. Characteristics of Patients

- Mean age of patients at the time of cataract surgery maintained at 64 years. This is much younger compared to age at mid-70s as reported by Swedish National Cataract Register.
- Larger percentage of patients presented within the age group of 65-74 years old (38.6%).
- Increasing trend in the proportion of patients who had systemic co-morbidity, from 56.8% in 2002 to 68.7% in 2008.
- Increasing trend in the specific systemic co-morbidities; hypertension (from 35.4% in 2002 to 50.9% in 2008), diabetes mellitus (from 28.9% in 2002 to 38.1% in 2008), ischaemic heart disease (from 9.0% in 2002 to 9.5% in 2008) and renal failure (from 1.6% in 2002 to 2.9% in 2008).
- Senile cataract was the most common cause of primary cataract (98.4%).
- Trauma was the most common cause of secondary cataract (62.3%).
- Only one-third of patients returned for cataract surgery for the fellow eye (68.0%).
- Majority of the eyes had no prior surgery (96.8%).The most common surgery performed among eyes which had prior eye surgery was vitreoretinal surgery (0.8%).
- One-third of the eyes had ocular co-morbidity (33.8%). The most common ocular co-morbidity was diabetic retinopathy in any forms (10.6%).
- 52.7% of patients had unaided vision and 32.5% had refracted vision in the blindness category (2/60-NPL). This trend was the same over the years.
- Refraction was not done prior to cataract surgery in more than 2/3 of the eyes (73.6%).
- Bimodal pattern of pre-operative vision observed over the years with one peak at the range between 6/18 to 6/36 and another peak at CF-HM.
- In terms of choice of IOL power, majority of the cataract surgeons choose target or intended refractive power as -0.5D (SD 0.4), in 2007 and -0.1D (SD 0.4) in 2008.This means most surgeons aimed to give patients either emmetropic or slightly myopic refraction post- operatively.

3. Cataract Surgery Practice Patterns

- Number of cataract surgery performed by SDPs varied. Approximately 50% of the SDPs performed less than 500 surgeries a year and 20% performed more than 1000 cataract surgeries a year. Hospitals which perform low number of surgery need to identify ways to increase the number so as to reduce cost per surgery.
- Each year, the number of cataract surgeries performed was lower than average in the month of February, October, September and December.
- Selangor, Perak, Johor, Penang and Sarawak performed higher number of cataract surgeries.
- Specialists performed more than 2/3 of total cataract surgeries (78.4%).
- Mean duration of surgery was 34.1 min for phaco and 45.8 min for ECCE. Surgeons at MOH hospitals need to find ways to shorten time taken for cataract surgery, especially when performing phaco.

- The proportion of patients (excluding children and combined surgeries) operated in day care was only 42.6%. Four out of 33 SDPs did not do any surgery as day care at all. Sixteen SDPs with Day Care Service performed less than 50% of the surgeries under Day Care. This reflects under-utilisation of day care services. As day care surgery is much more cost-effective, ways to increase day care surgery should be sought.
- Phaco has become the preferred method of cataract surgery since 2004 and has increased from 39.7% in 2002 to 69.1% in 2008. ECCE has dropped from 54.0% in 2002 to 26.3% in 2008.
- The rate of phaco converted to ECCE was 2.4%. The value stayed constant over the years. This may indirectly reflect the competency of new phaco surgeons during their learning curve. A better competency monitoring of individual surgeon is through CUSUM monitoring.
- Proportion of cataract surgery performed in combination with VR surgery reduced from 2.4% in 2007 to 1.1% in 2008. This may reflect individual VR surgeons' practice pattern.
- Majority of cases were done under local anaesthesia (94.3%). The preferred type of local anaesthesia was subtenon injection (54.6%).
- There is a constant increase in the usage of topical anaesthesia (11.7% in 2002 to 33.1% in 2008) and decrease in the use of peribulbar anaesthesia (21.7% in 2002 to 6.1% in 2008) and in the use of retrobulbar anaesthesia (25.9% in 2002 to 5.9% in 2008).
- There is a decreased use of sedation (33.3% in 2002 to 14.5% in 2008). Data by SDP showed that the practice of prescribing oral sedation to patients before cataract surgery was specific to certain hospitals and thus indicating practice pattern of specific doctors working in those hospitals.
- Majority of the patients had IOL implantation (98.2%). Out of this proportion, 96.3% had posterior chamber IOL.
- Acrylic and foldable IOL were the preferred choice of IOL implanted.

4. Intra-operative Complications

- The rate of all intra-op complication has been decreasing from 10.4 % in 2002 to 7.6% in 2008.
- There is a decreasing trend in the specific intra-operative complications; PCR (from 6.0% in 2002 to 3.7% in 2008), vitreous loss (from 5.7% in 2002 to 2.8% in 2008) and zonular dehiscence (from 1.9% in 2002 to 1.5% in 2008).
- The rates of any complication were higher in phaco converted to ECCE (45.8%) and ICCE (46.5%).
- The rate of any complication was higher in surgeries performed by the gazetting specialists (11.9%).
- As for rate of PCR, 27 SDPs achieved the national KPI standard, which is below 5%.

5. Cataract Surgery Outcome

- The rate of post-operative endophthalmitis was 0.11% (1.1 cases in 1000 cataract surgeries). It demonstrated a decreasing trend over the years.
- The rate of unplanned return to OT was 0.43%. The common reasons were iris prolapse, wound dehiscence and IOL related problem. IOL related problem showed an increasing trend over the years.
- For visual outcome among patients who were without ocular co-morbidity, the outcome based on unaided visual outcome was not satisfactory. Only 27.8% of patients following ECCE and 40.0% following phaco achieved unaided VA 6/12 or better. This may be due to refractive error (IOL power related to biometry or surgically induced astigmatism) rather than ocular co-morbidity because the proportion of patients with VA 6/12 or better increased double folds following refraction. With refraction, 80.8% of patients following ECCE and 91.3% of patients following phaco achieved VA 6/12 or better.
- The visual outcome results reflect that following cataract surgery, a large number of patients need to wear glasses in order to see better.
- Patients who had phaco had better visual outcome when compared to patients who had other forms of cataract surgery. The rate for VA 6/12 or better increased from 86.8% in 2002 to 91.3% in 2008.

- Post-op VA 6/12 or better for patients who had ECCE has also increased from 77.5% in 2002 to 80.8% in 2008.
- In all types of surgeries, visual outcome became less favourable following occurrence of intra-operative complications.
- In all types of surgeries, visual outcomes were better in eyes with IOL implantation, especially with foldable IOL and IOL made of Acrylic.
- The main contributing factor for eyes with post-operative refracted VA worse than 6/12 was pre-existing ocular co-morbidity followed by high astigmatism and PCO.
- When patients with pre-existing ocular co-morbidity were excluded from analysis, high astigmatism was the major cause of poor vision followed by pre-existing ocular co-morbidity (not detected preoperatively).
- Although more surgeons aimed for their patients to have near emmetropia after surgery, the final refraction for patients who had phaco was at -0.8D in 2007 and 0.0 D in 2008, and for patients who had ECCE, it was -1.1 D in 2007 and -0.2 in 2008.
- Eyes that had ECCE had more myopic shift than eyes that had phaco.
- There was a large disparity between the targeted and the actual refraction. Only one-quarter of the patients achieved what was aimed for pre-operatively.

DIABETIC EYE REGISTRY

1. Stock and Flow

- A total of 22870 new diabetic patients were registered to DER from 2007-2008. The number increased from 10856 in 2007 to 12014 in 2008.
- Average number of cases registered per month increased from 905 to 1001 in 2008.
- Number registered by SDP varied widely.

2. Characteristic of Diabetic Patients

- Mean age of patient was 57.3 years.
- More than half were of working age group (between 30 and 60 years).
- More females were registered (56.2% in 2008)
- More Malays were registered (55.0% in 2008).
- No difference in the mean age for those with DR (56.6 years) and without DR (57.1 years).
- Percentage of DR was higher among females. It increased from 53.6% in 2007 to 55.3% in 2008.
- Proportion of patients screened and registered was similar to national ethnic distributions, highest in Malay, followed by Chinese, Indians and others.
- In contrast to 2007 where the proportion of those with DR were similar among the three main ethnic groups, data in 2008 showed the proportion to be highest among the Malays (41.3%) followed by Chinese (36.6%) and Indians (32.6%).
- Government hospitals and primary health clinics were the main source of referral (93.2%). Only 2% were referred from private care providers.

3. Medical History and Practice Pattern

- Majority of patients had type II DM.
- Percentage of patients with DM 10 years or less was more than 60.0%.
- Percentage of patients with DM more than 20 years was 3.1% in both 2007 and 2008.
- Percentage of patients on oral medication was 80.0%.

- Percentage of patients on insulin was 10.6%.
- Hypertension was one of the most common systemic co-morbidity (63.4%) followed by hypercholesterolaemia (18.1%), ischaemic heart disease (10.3%), and renal impairment (5.5%).
- Of those screened, 7.1% were smokers.
- Cataract was detected in 43.1% of patients.
- Glaucoma was detected in 2.3% of patients.
- More pregnant diabetic patients were registered in 2008. (148 or 2.5% of females in 2007 to 208 or 3.1% of females in 2008).
- Although the percentage of pregnant diabetics registered to DER during the first trimester was still not satisfactory in both years (40.7%), the number has increased from 36.5% in 2007 to 43.8% in 2008.
- In contrast to year 2007 where most of pregnant diabetic were registered during 2nd trimester, most of them were registered during 1st trimester in 2008.
- Large percentage of patients with no previous eye examinations - 70.9% in 2007 and 72.0% in 2008).
- Among patients with previous eye examination, more than 60.0% had the examination 1 year prior to being registered to DER.

4. Eye Status

- Percentage of patients with presenting VA in the low vision category (6/18-3/60) was approximately 30.0%-40.0%.
- Percentage of patients with presenting VA in the blindness category (2/60-NPL) was approximately 9.0%.
- Eyes with DR presented with worse vision as compared with eyes without DR.
- Among patients screened, more than half had no apparent DR in both their eyes (60.4% in 2007 and 50.8% in 2008).
- Up to 38.2% in 2007 and 36.1% in 2008 had some form of DR in either eye and 11.9% in 2007 and 9.6% in 2008 had maculopathy.
- Percentage of mild – moderate NPDR was 67.3% in 2007 and 76.8% in 2008.
- Percentage of severe NPDR was 8.6% in 2007 and 18.7% in 2008.
- Percentage of PDR was 18.1% in 2007 and 11.4% in 2008.
- Percentage of ADED was 5.9% in 2007 and 4.8% in 2008.
- Percentage of patients with vision threatening DR (PDR and maculopathy) was 15.6% in 2007 and 11.5% in 2008.

5. Treatment Plan

- Majority of patients did not require treatment (83.0%).
- Laser photocoagulation was required in approximately 10.0% of patients.
- Vitrectomy was required in 3.1% of patients in 2007 and 0.5% patients in 2008.
- Further assessment such as FFA was required in approximately 0.5% of patients.

CONTACT LENS RELATED CORNEAL ULCER SURVEILLANCE

1. Stock and Flow

- A total of 103 cases reported in the 2007 and 99 cases reported in 2008.
- No outbreak of contact lens related keratitis in the MOH Hospitals during the year 2007 and 2008.

2. Distribution of Cases by Centre

- Hospital Melaka, Hospital Kuala Lumpur and Hospital Sultanah Aminah Johor Bahru reported the highest number of contact lens related keratitis in 2007.
- Hospital Melaka, Hospital Selayang and Hospital Sungai Buloh reported the highest number of contact lens related keratitis in 2008.

3. Patient Demography

- Median age was 25 in 2007 and 24 in 2008.
- Majority of patients were females and Malays.

4. Data on Contact Lens-Related Corneal Ulcer at Presentation

- Bilateral involvement was reported in six cases in 2007 and ten cases in 2008.
- Majority of cases occurred among those who used monthly disposable contact lens.
- Most popular choice of contact lens cleaning solution was from Bausch and Lomb.
- Approximately 1/3 had unaided vision of 3/60 or worse at the time of presentation.
- Eighty-seven percent of the cases were presumptively treated as bacterial corneal ulcer at presentation.
- Cornea scraping was performed in 80% of the eyes. The contact lens and contact lens cleaning solution were sent for microbiological examination in less than half of the cases.
- Rate of positive culture results for corneal scraping was 37.4% in 2007 and 36.9% in 2008.
- Pseudomonas was the most common bacterial isolate from corneal scraping, contact lens and contact lens solution.

5. Outcome by One Month After Presentation

- About 30% had corrected vision of 6/12 or better at one month after presentation.
- In 2008, three cases were complicated by corneal perforation. Two cases were managed by corneal gluing and one by penetrating keratoplasty.

GLAUCOMA REGISTRY

1. Stock and Flow

- In 2008, a total of 23 SDPs from MOH ophthalmology departments collected data for the glaucoma registry.
- A total of 4481 patients were registered, 88.2% were follow-up cases and 11.2% were new cases.

2. Characteristics of Patients

- Median age was within the range of 60-69 years.
- There was a slight female preponderance (54.0%).
- Majority of patients were unemployed (77.4%).
- Proportion of patients registered differed from the national ethnic distributions; Chinese was the highest (41.5%), followed by Malays (36.0%), Indians (17.8%) and others (4.7%).

3. Medical History

- Percentage of patients with systemic co-morbidity was 67.7%; Hypertension was the most common (43.0%) followed by diabetes mellitus (39.4%).
- A total of 113 patients had family history of glaucoma and 55 patients had history of steroid usage.

4. Clinical Features

- Proportion of patients with vision 6/12 or better was 65.9%.
- Proportion of patients with low vision (6/18-4/60) was 21.6%.
- Proportion of patients in the blindness category (3/60-PL) was 7.5%.
- Proportion of patients with NPL was 5%.
- Proportion of eyes with CDR 0.5 or larger was more than 76.4%.
- Proportion of eyes with CDR 0.9/1.0 was 18.5%.

5. Types of Glaucoma

- Majority of the eyes had primary type of glaucoma (69.1%) followed by secondary glaucoma (10.0%) and glaucoma suspect (15.6%).
- Among the primary type of glaucoma, POAG was the most common (67.5%) followed by PACG (15.5%), ocular hypertension (4.8%), PAC (1.5%), PACS (0.8%) and others (9.9%).
- Among the secondary type of glaucoma, the few common types of glaucoma were post-surgery (15.9%), pseudoexfoliative (14.9%), rubeotic (14.5%), post-trauma (11.7%), steroid-induced (6.5%) and inflammatory (6%).

6. Management of Glaucoma

- The most common mode of management was medical treatment (either mono or combined therapy).
- The most frequent eye drop prescribed was beta blockers, followed by prostaglandin analog and topical Carbonic Anhydrase Inhibitors.

AGE RELATED MACULAR DEGENERATION REGISTRY

1. **Stock and Flow**

- A total of 52 AMD patients with 104 eyes were registered.

2. **Patient Demography and Vision**

- Mean age was 65.6 years.
- Mean duration of symptoms was 15.4 months.
- Proportion of eyes with VA of 6/12 or better was 38.5, VA 6/18-3/60 was 23.1% and with VA 3/60 or worse was 38.5%.

3. **Status of AMD**

- Half of the eyes had exudative AMD.
- Disciform scar was present in 27.2% of eyes.
- Central geographic atrophy was present in 8.6 % of eyes.
- Polypoidal choroidal vasculopathy was present in 14.8 % of eyes.
- Active choroidal neovascularization was present in 18.5% of eyes.
- Majority of patients present late to the tertiary referral centre.

RETINOBLASTOMA REGISTRY

1. Stock and Flow

- A total of 24 patients registered; 12 patients were diagnosed in 2007.

2. Patients Demography

- Mean age at presentation was 2.19 years.
- Youngest age was 1 month and oldest was 5.5 years.

- About half (45.8%) of these patients were in the age group of 13 to 24 months.
- More boys than girls were affected.
- Majority were of Malay ethnicity (62.5%), followed by Chinese (12.5%) and Indians (8.3%).

3. Ocular History and Presentation

- Leukocoria was the most common presentation feature.
- Highest percentage (30.4%) presented between 13 and 24 months of age.
- Mean duration of disease from onset of symptoms to presentation was 5.4 months with the majority (73.9%) within 1 to 6 months.
- Five patients (20.8%) presented with bilateral retinoblastoma.
- All patients had no positive family history of retinoblastoma.
- Most eyes were blind at presentation.

4. Investigation and Classification

- Based on CT scan, 26 eyes had presence of mass; 24 eyes had calcifications and five eyes showed evidence of extraocular extension.
- Two-thirds (65.52%) of the patients presented with Group E Retinoblastoma.

5. Management

- Enucleation was done in 19 patients.
- Systemic chemotherapy was given in 11 patients.
- Subtenon injection of chemotherapy combined with systemic chemotherapy were given in two patients.
- Focal therapy was given together with chemoreduction.
- No patients had focal therapy only.
- No patient had radiotherapy.

CHAPTER 1

CATARACT SURGERY REGISTRY

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CHAPTER 1 CATARACT SURGERY REGISTRY

1.1 STOCK AND FLOW

The number of cataract surgery registry (CSR) source data provider (SDP) continued to increase over the years – from 25 SDPs in 2002 to 36 SDPs in 2008. The number of cataract surgeries being registered to CSR has also increased from 12798 in 2002 to 21496 in 2008.

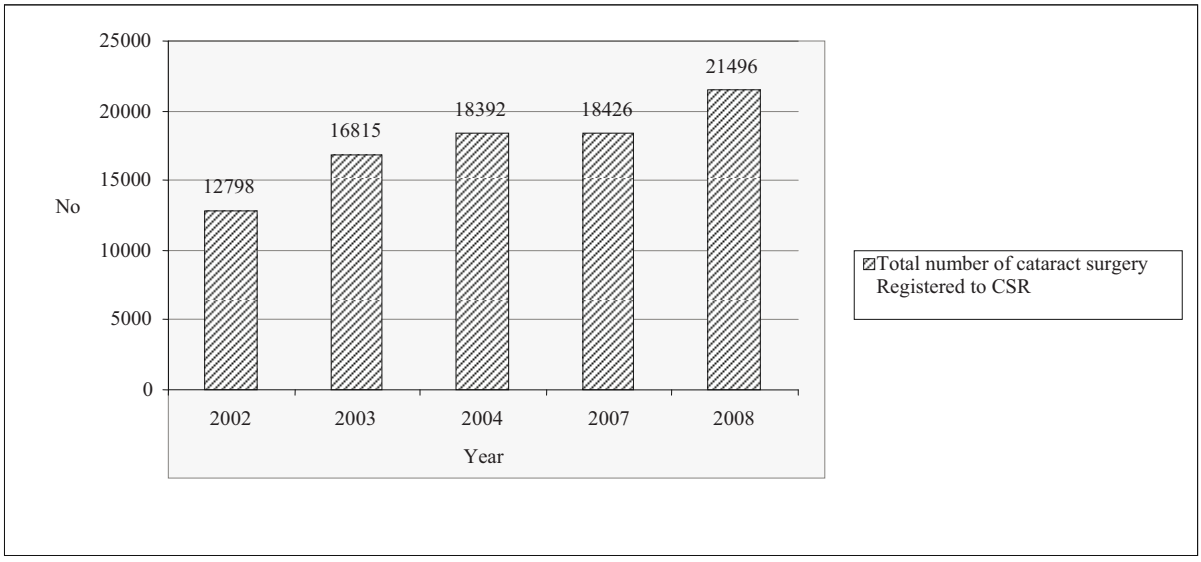
From 2002-2004, CSR was a paper-based registry. During this period, there was a constant decrease in the percentage of patients with visual outcome recorded in CSR. However when the web-based registry was implemented in 2007, there could be a beginning of an increasing trend when it showed a moderate improvement in the percentage within 2 years i.e. from 85.7% in 2007 to 88.7% in 2008.

Table 1.1(a) Stock and Flow

Year	2002		2003		2004		2007		2008	
Number of SDP	25*		32*		33*		32		36	
Total number of cataract surgery registered to CSR	12798		16815		18392		18426		21496	
	No	%	No	%	No	%	No	%	No	%
Cataract surgery with visual outcome records	12512	97.7	14683	87.3	6228	33.9	15786	85.7	19063	88.7

*SDP in 2002, 2003 and 2004 included private centre and University Hospital

Figure 1.1(a): Stock and Flow



The ascertainment rate was maintained at more than 80% for the past 7 years. The reduced ascertainment rate which was observed in 2007 could be due to the change from a paper-based to a web-based registry. The rate improved to 84.6% in 2008.

Table 1.1(b): Ascertainment Rate for MOH Hospitals, CSR 2002-2008

Year	2002	2003	2004	2007	2008*
Total number of cataract surgery performed at MOH Hospitals (Source: MOH census returns)	14316	16498	18884	22051	25393
Total number of cataract surgery performed at MOH hospitals and registered to CSR	12552	16039	17536	18426	21496
Ascertainment rate (%)	87.6	97.2	92.9	83.6	84.6

*Four hospitals had less than 50% of ascertainment

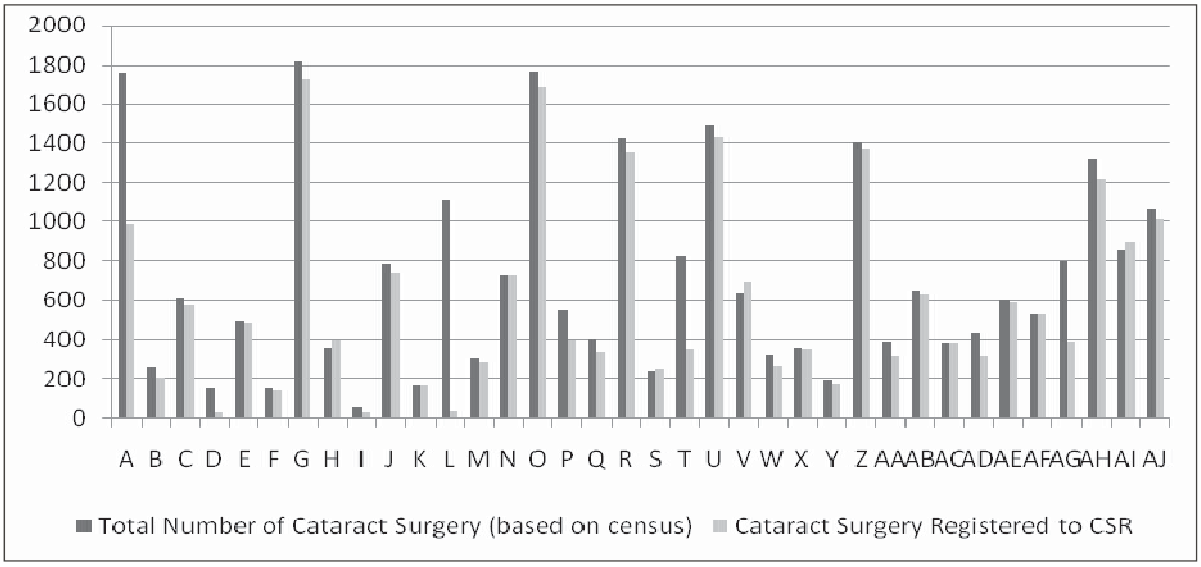
In terms of ascertainment rate by SDP, five SDPs have higher than 100% as they reported more cataract surgery to CSR than to census. Twenty five SDP obtained higher ascertainment rate than aggregate average at 84.6%. Hospital D, L, T and AG had < 50.0% ascertainment rate in CSR. Hospital D, F, AD and AG had ascertainment rates of <50.0% in terms of outcome with refracted vision. These hospitals were excluded in certain analysis particularly on visual outcome.

Table 1.1(c): Ascertainment Rate for Cataract Surgery Registry by SDP in 2008

						Ascertainment Rate			
	Total no. of cataract surgery (based on census) (a)	Total no. of cataract surgery registered to CSR (based on operative record) (b)	Total no. of outcome form submitted (c)	Total no. of outcome form with unaided vision (d)	Total no. of outcome form with refracted vision (e)	% Ascertainment for CSR (b/a*100)	% Ascertainment for Outcome form submitted (c/b*100)	% Ascertainment for Outcome with unaided vision (d/c*100)	% Ascertainment for Outcome with refracted vision (e/c*100)
All Centres	25393	21496	20521	19064	17240	84.6	95.5	92.9	84.0
A	1754	986	941	909	804	56.2	95.4	96.6	85.4
B	259	208	208	197	192	80.3	100	94.7	92.3
C	608	573	541	482	456	94.2	94.4	89.1	84.3
D	152	30	29	29	11	19.7	96.7	100.0	37.9
E	492	487	487	435	426	99.0	100	89.3	87.5
F	150	137	136	136	54	91.3	99.3	100.0	39.7
G	1817	1723	1560	1482	1330	94.8	90.5	95.0	85.3
H	354	400	400	398	363	113.0	100	99.5	90.8
I	57	34	20	19	18	59.6	58.8	95.0	90.0
J	782	739	630	594	586	94.5	85.3	94.3	93.0
K	172	170	168	135	135	98.8	98.8	80.4	80.4
L	1113	40	40	39	33	3.6	100	97.5	82.5
M	305	282	275	267	220	92.5	97.5	97.1	80.0

	Total no .of cataract surgery (based on census) (a)	Total no. of cataract surgery registered to CSR (based on operative record) (b)	Total no. of outcome form submitted (c)	Total no. of outcome form with unaided vision (d)	Total no. of outcome form with refracted vision (e)	% Ascertainment for CSR (b/a*100)	% Ascertainment for Outcome form submitted (c/b*100)	% Ascertainment for Outcome with unaided vision (d/c*100)	% Ascertainment Outcome with refracted vision (e/c*100)
N	731	726	714	695	648	99.3	98.3	97.3	90.8
O	1768	1681	1656	1608	1405	95.1	98.5	97.1	84.8
P	548	396	372	275	296	72.3	93.9	73.9	79.6
Q	406	338	337	318	290	83.3	99.7	94.4	86.1
R	1421	1357	1281	1272	1168	95.5	94.4	99.3	91.2
S	239	256	256	253	234	107.1	100	98.8	91.4
T	824	351	351	340	273	42.6	100	96.9	77.8
U	1488	1429	1429	1388	1082	96.0	100	97.1	75.7
V	639	696	695	683	601	108.9	99.9	98.3	86.5
W	321	263	202	196	195	81.9	76.8	97.0	96.5
X	353	350	350	89	332	99.2	100	25.4	94.9
Y	196	180	180	178	176	91.8	100	98.9	97.8
Z	1408	1376	1213	1092	1064	97.7	88.2	90.0	87.7
AA	393	319	319	301	274	81.2	100	94.4	85.9
AB	654	633	618	605	506	96.8	97.6	97.9	81.9
AC	378	379	379	377	369	100.3	100	99.5	97.4
AD	438	317	279	209	123	72.4	88	74.9	44.1
AE	599	588	588	531	528	98.2	100	90.3	89.8
AF	532	531	531	433	415	99.8	100	81.5	78.2
AG	796	395	265	132	35	49.6	67.1	49.8	13.2
AH	1325	1217	1217	1196	1115	91.8	100	98.3	91.6
AI	860	898	844	778	743	104.4	94	92.2	88.0
AJ	1061	1011	1010	993	740	95.3	99.9	98.3	73.3

Figure 1.1(c): Ascertainment Rate for Cataract Surgery Registry by SDP in 2008



1.2 CHARACTERISTICS OF PATIENT

1.2.1 Patient Demography

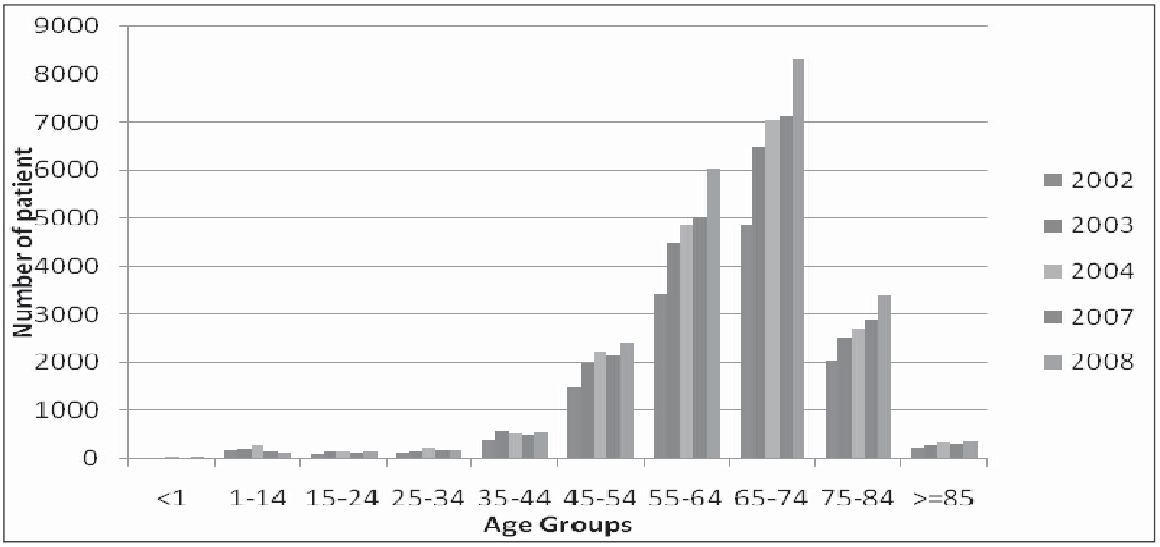
The mean age of patients presented for cataract surgery has been consistent at 64 years over the years and in 2008, it was 64.6 years. The minimum age, was similar to previous years, at 1 month old but the maximum age increased to 102 years old.
A larger percentage of patients presented within the age group of 65-74 years old except for the year 2007. There was no marked gender difference over the last 7 years. The slight female preponderance reflected higher female ratio in the aging population.

Table 1.2.1: Age and Gender Distributions, CSR 2002-2008

Year	**2002***		**2003***		**2004***		**2007**		**2008**	
Total number of cataract surgery	12798		16815		18392		18426		21496	
Age,										
Mean (years)	64.0		63.7		63.5		64.3		64.6	
Median (years)	66		66		66		66		66	
Minimum (month)	1		1		1		1		1	
Maximum (years)	97		100		104		97		102	
% Distribution										
Age group, years	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
<1	21	0.16	23	0.14	50	0.3	18	0.10	34	0.2
1-14	171	1.34	202	1.2	266	1.5	50	0.27	116	0.5
15-24	101	0.79	139	0.83	134	0.7	141	0.77	133	0.6
25-34	115	0.9	147	0.87	207	1.1	120	0.65	167	0.8
35-44	376	2.94	575	3.42	526	2.9	157	0.85	539	2.5
45-54	1,472	11.5	1,974	11.74	2,238	12.2	499	2.71	2407	11.2
55-64	3,415	26.68	4,496	26.74	4,882	26.5	2,135	11.59	6037	28.1
65-74	4,880	38.13	6,480	38.54	7,051	38.3	5,031	27.30	8307	38.6
75-84	2,041	15.95	2,511	14.93	2,722	14.8	7,103	38.55	3391	15.8
>=85	206	1.61	264	1.57	316	1.7	2,889	15.68	344	1.6
Missing	NA	-	4	0.02	NA	-	283	1.54	21	0.1
Gender										
Male	6308	49.29	8397	49.94	9034	49.12	8820	47.87	10295	47.89
Female	6490	50.71	8418	50.06	9358	50.88	9606	52.13	11168	51.95
Missing	0	0	0	0	0	0	0	0	33	0.15

*2002, 2003 and 2004 included private centres and university hospitals

Figure 1.2.1: Age Distribution, CSR 2002-2008



1.2.2 Medical history

1.2.2.1 Systemic co-morbidity

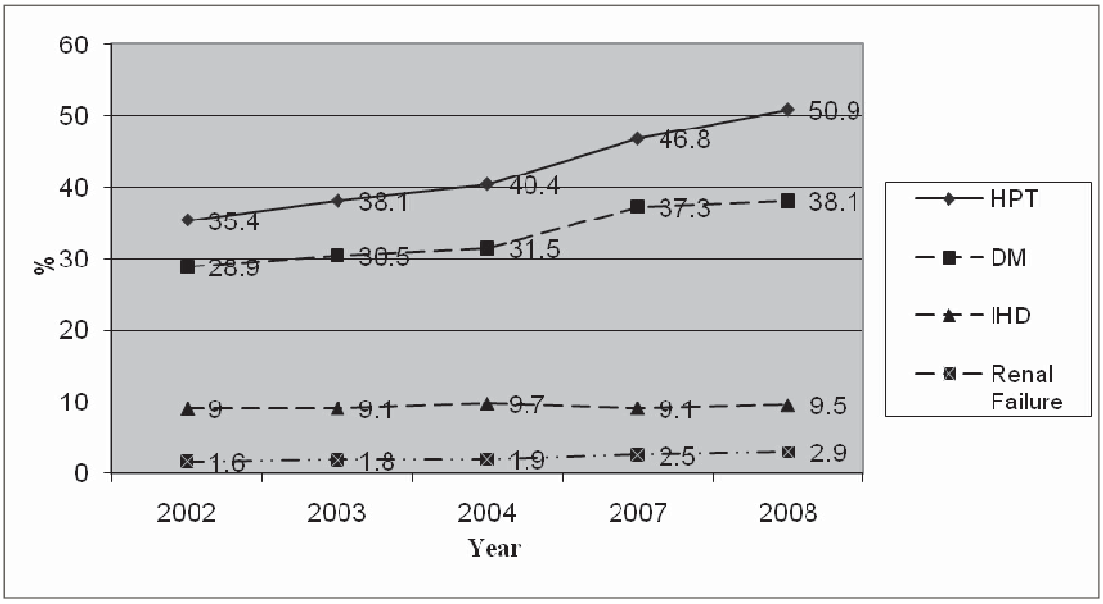
About half to two-third of the patients who came for cataract surgery had systemic co-morbidity. The most common being hypertension, followed by diabetes mellitus, ischaemic heart disease and renal failure. The proportions were increasing over the years.

Table 1.2.2.1: Distribution of Systemic Co-Morbidity, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No of patients (N)	12798		16815		18392		18426		21496	
Percentage of patients with any systemic co-morbidity	56.8		59.1		59.9		67.5		68.7	
Percentage of patients with specific systemic co-morbidity										
	No	%	No	%	No	%	No	%	No	%
1.Hypertension	4529	35.4	6408	38.1	7425	40.4	8630	46.8	10932	50.9
2.Diabetes Mellitus	3694	28.9	5136	30.5	5800	31.5	6869	37.3	8188	38.1
3.Ischaemic Heart Disease	1148	9.0	1538	9.1	1782	9.7	1668	9.1	2037	9.5
4.Renal Failure	211	1.6	303	1.8	351	1.9	461	2.5	624	2.9
5.Cerebrovascular accident	106	0.8	165	1.0	174	0.9	0	0.0	29	0.1
6.COAD/Asthma	669	5.2	907	5.4	955	5.2	798	4.3	955	4.4
7.Others	935	7.3	2409	7.2	861	4.7	1399	7.6	1974	9.2

Number or Percentage may be more than total or 100% as patients might have more than one systemic co-morbidity

Figure 1.2.2.1: Percentage of Patients with Specific Ocular Co-morbidity, CSR 2002-2008



1.2.2.2 Causes of cataract

Majority of the patients presented with primary cataract. Among eyes with primary cataract, senile or age-related cataract was the most common. Among eyes with secondary cataract, trauma was the most common cause. This pattern remained unchanged over the years.

Table 1.2.2.2: Causes of Cataract, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No of patients (N)	12798		16815		18392		18426		21496	
	No	%	No	%	No	%	No	%	No	%
Primary cataract	12294	96.1	16161	96.1	17697	96.2	17410	94.4	20329	94.6
Secondary cataract	499	3.9	654	3.9	695	3.8	557	3.0	530	2.5
Missing value	-	-	-	-	-	-	460	2.5	637	3.0
Primary Cataract (n)	12294		16161		17697		17410		20329	
• Senile/age-related	11960	97.3	15623	96.7	17290	97.7	17075	98.1	19995	98.4
• Congenital	130	1.1	175	1.1	173	1.0	129	0.7	124	0.6
• Development	155	1.3	317	2.0	209	1.2	169	1.0	156	0.8
• Others	49	0.4	46	0.3	25	0.1	37	0.2	54	0.3
Secondary Cataract (n)	499		654		695		557		530	
• Trauma	325	65.1	399	61.0	440	63.3	355	63.7	330	62.3
• Drug induced	53	10.6	81	12.4	84	12.1	55	9.9	76	14.3
• Surgery induced	23	4.6	67	10.2	56	8.1	82	14.7	39	7.4
• Others	98	19.6	107	16.4	115	16.5	65	11.7	85	16.0

1.2.2.3 First or Fellow Eye Surgery

Two-third of the patients came for the first time for cataract surgery, i.e. had operation in their first eyes. Only one-third of the patients returned for fellow eye surgery. This pattern remained unchanged since 2002. Only 5% had fellow eye surgery in the same year. The mean duration between first and fellow eye surgery was between 16 to 23 months.

Table 1.2.2.3: First or Fellow Eye Surgery, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No of patients (N)	12798		16815		18392		18426		21496	
	No	%	No	%	No	%	No	%	No	%
First eye surgery	8958	70.0	11851	70.5	12911	70.2	12810	69.5	14610	68.0
Fellow eye surgery	3840	30.0	4964	29.5	5481	29.8	5559	30.2	6849	31.9
Missing	NA	-	NA	-	NA	-	57	0.3	37	0.2
Patients who had second surgery in the same year	573	4.5	713	4.2	825	4.5	759	4.1	1135	5.3
Period of time between first and fellow eye surgery (Months)										
N	2716		3322		3673		4860		5953	
Mean	16.7		16.3		16.9		23.4		22.0	
SD	18.0		17.1		18.8		24.3		22.8	
Median	10.3		10.1		10.5		13.3		13.1	
Patients who had cataract surgery before	9092		11894		12924		12867		15994	
	No	%	No	%	No	%	No	%	No	%
Eyes with intra-operative complications during surgery in the first eye	939	10.3	1179	9.91	1235	9.6	313	2.43	298	1.86

1.2.2.4 Past ocular surgery of the operated eye

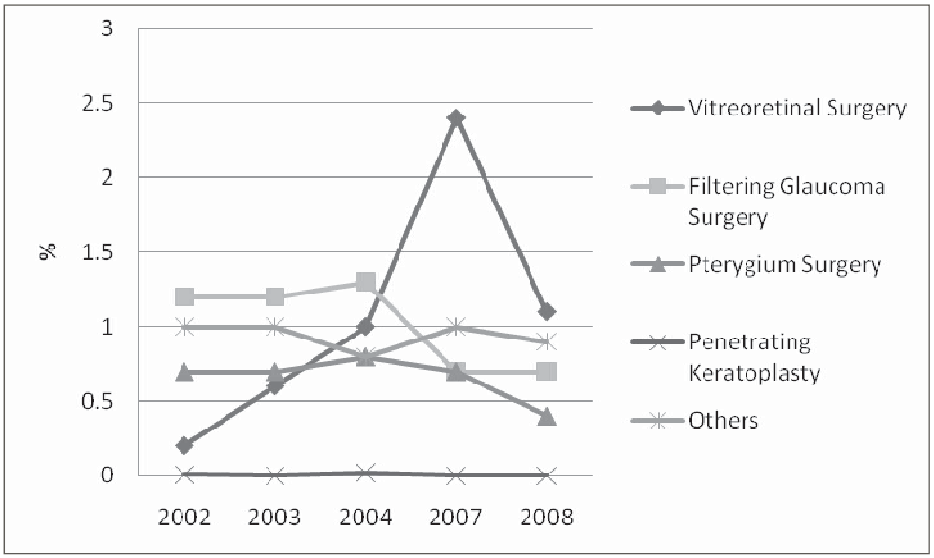
Most eyes to be operated had no prior ocular surgery. Among eyes with past ocular surgery, the most common was vitreoretinal surgery followed by pterygium excision.

Table 1.2.2.4: Past Ocular Surgery of the Operated Eye, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No of patients (N)	12798		16815		18392		18426		21496	
No of patients who had data on past ocular surgery (denominator)	12798		16782		18372		17379		20674	
	No	%	No	%	No	%	No	%	No	%
Patients with no past ocular surgery	12414	97.0	16178	96.4	17711	96.4	16545	95.2	20010	96.8
Vitreoretinal surgery	8959	0.7	1510	0.9	1653	0.9	261	1.4	161	0.8
Pterygium excision	77	0.6	1177	0.7	92	0.5	869	0.5	140	0.7
Filtering surgery	77	0.6	1007	0.6	1102	0.6	1043	0.4	57	0.3
Penetrating keratoplasty	13	0.1	168	0.1	184	0.1	1738	0.1	14	0.1
Others	1408	1.1	235	1.4	276	1.5	417	2.4	304	1.5

Number or Percentage may be more than total or 100% as patients might have more than one past ocular surgery

Figure1.2.2.4 Percent Distribution of Past Ocular Surgery of the Operated Eye, CSR 2002-2008



1.2.2.5 Pre-existing ocular co-morbidity

One-third of the eyes to be operated had ocular co-morbidities. The most common was diabetic retinopathy in any forms followed by glaucoma. The percentage of eyes with diabetic retinopathy appeared to be increasing over the years. However these figures might not be accurate because the posterior segment could not be assessed in 1/10 of the eyes.

Although in a downward trend, there were still a significant number of patients presented with lens-related complication.

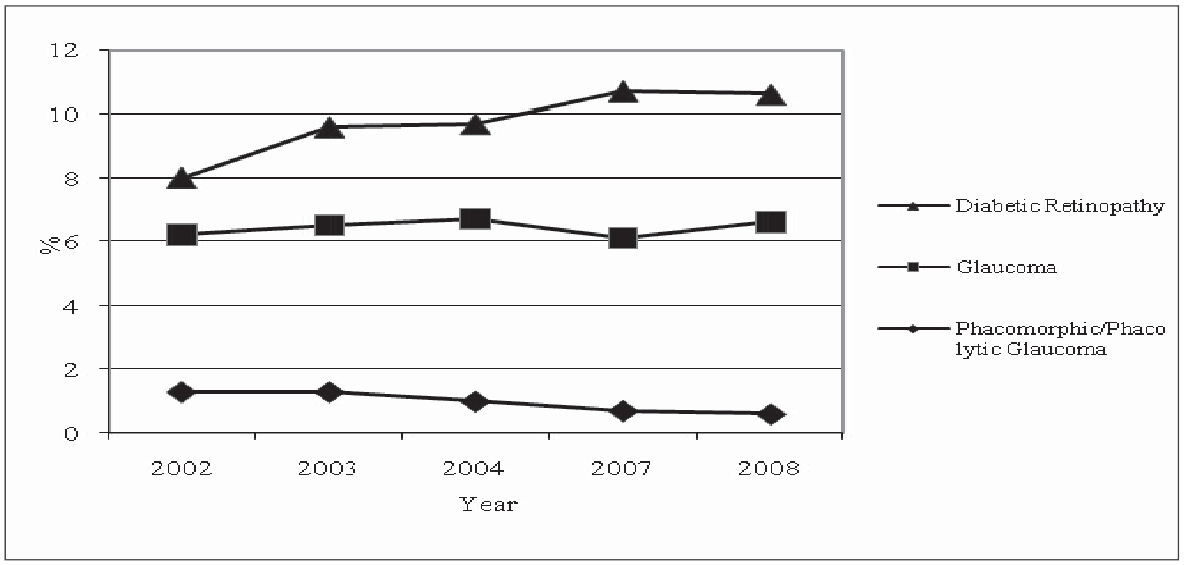
Table 1.2.2.5 Distribution of Pre-existing Ocular Co-Morbidity, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No of patients (N)	12798		16815		18392		18426		21496	
	No	%	No	%	No	%	No	%	No	%
Patients with any ocular co-morbidity	3691	28.8	6068	36.1	6993	38.0	5973	32.4	7269	33.8
Patients with specific ocular co-morbidity										
Anterior segment										
1.Glaucoma	795	6.2	1096	6.5	1238	6.7	1126	6.1	1408	6.6
2.Pterygium involving the cornea	342	2.7	393	2.3	349	1.9	288	1.6	319	1.5
3.Pseudoexfoliation	184	1.4	254	1.5	209	1.1	221	1.2	253	1.2
4.Corneal opacity	184	1.4	200	1.2	183	1.0	176	1.0	194	0.9
5.Chronic uveitis	54	0.4	48	0.3	80	0.4	81	0.4	63	0.3
Lens-related complication										
1.Phacomorphic	106	0.8	152	0.9	118	0.6	89	0.5	85	0.4
2.Phacolytic	61	0.5	63	0.4	79	0.4	44	0.2	45	0.2
3.Subluxated/Disclosed	87	0.7	110	0.7	86	0.5	101	0.5	89	0.4
Posterior segment										
1.Diabetic Retinopathy: Non Proliferative	642	5.0	965	5.7	956	5.2	1125	6.1	1273	5.9
2.Diabetic Retinopathy: Proliferative	218	1.7	366	2.2	510	2.8	465	2.5	614	2.9
3.Diabetic Retinopathy: CSME*	96	0.8	177	1.1	163	0.9	198	1.1	221	1.0
4.Diabetic Retinopathy: Vitreous haemorrhage	66	0.5	106	0.6	138	0.8	176	1.0	165	0.8
5.ARMD	145	1.1	215	1.3	308	1.7	231	1.3	259	1.2
6.Other macular disease (includes hole or scar)	77	0.6	106	0.6	140	0.8	118	0.6	148	0.7
7.Optic nerve disease, any type	43	0.3	76	0.5	78	0.4	71	0.4	69	0.3
8.Retinal detachment	70	0.5	177	1.1	247	1.3	218	1.2	204	0.9
9.Cannot be assessed	884	6.9	1962	11.7	2290	12.5	1357	7.4	2092	9.7
Miscellaneous										
1.Amblyopia	64	0.5	61	0.4	78	0.4	71	0.4	65	0.3
2.Significant previous eye trauma	52	0.4	80	0.5	96	0.5	41	0.2	39	0.2
3.Pre-existing non glaucoma field defect	2	0.0	3	0.0	4	0.0	4	0.0	2	0.0
4.Others	380	3.0	827	4.9	1153	6.3	668	3.6	755	3.5

*CSME=Clinical Significant Macular Oedema

Number or Percentage may be more than total or 100% as patients might have more than one ocular co-morbidity

Figure 1.2.2.5: Percent Distribution of Patients with Diabetic Retinopathy, Glaucoma or Lens-induced Glaucoma, CSR 2002-2008



1.2.2.6 Pre-operative vision

A high proportion of patients did not have refraction pre-operatively especially in 2002 to 2004. The proportion became less in 2007 and 2008 at 73%.

More than half of the eyes to be operated had unaided vision in the blindness category (2/60-NPL) and up to one-third had refracted vision in the blindness category. These proportions remained unchanged over the years.

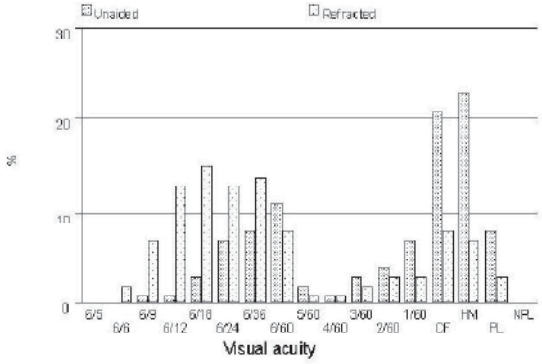
Figure 1.2.2.6 showed the bimodal pattern of pre-operative vision which had been persistent over the years. The first peak was at 6/18 and the second peak was at CF/HM. There was a low proportion of patients between 5/60 and 1/60.

Table 1.2.2.6: Distribution of Pre-Operative Vision, CSR 2002-2008

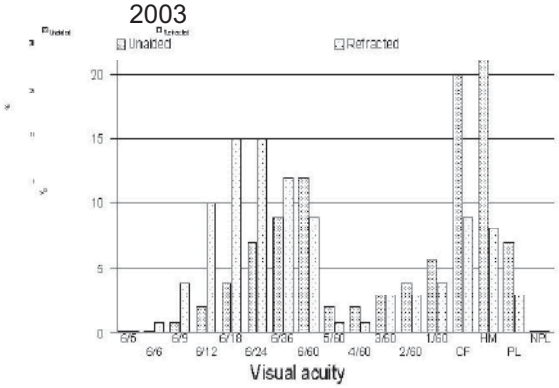
Year		2002		2003		2004		2007		2008	
No of patients (N)		12798		16815		18392		18426		21496	
		No	%	No	%	No	%	No	%	No	%
Patients with unaided VA		12691	99.2	16723	99.4	18222	99.1	18356	99.6	21212	98.7
Patients with refracted VA		700	5.5	2104	12.6	2319	12.7	5071	27.8	5683	26.4
Patients with no refraction		12098	94.5	14711	87.5	16073	87.4	13355	72.5	15813	73.6
6/5-6/12	Unaided	281	2.2	396	2.4	523	2.9	602	3.3	646	3.0
	Refracted	155	22.1	327	15.5	396	17.1	678	13.3	935	16.4
6/18-3/60	Unaided	4465	35.2	6440	38.5	7235	39.7	7734	42.4	9375	44.2
	Refracted	374	53.4	1198	56.9	1315	56.7	2375	46.9	2892	50.9
2/60-NPL	Unaided	7945	62.6	9887	59.1	10464	57.4	9920	54.3	11180	52.7
	Refracted	171	24.4	579	27.5	608	26.2	2018	39.8	1845	32.5

Figure 1.2.2.6: Distribution of Pre-Operative Vision, CSR 2002-2008

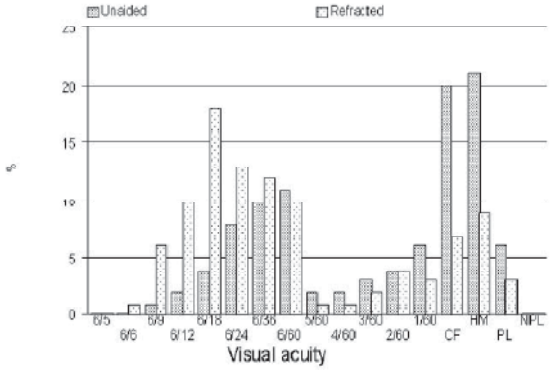
2002



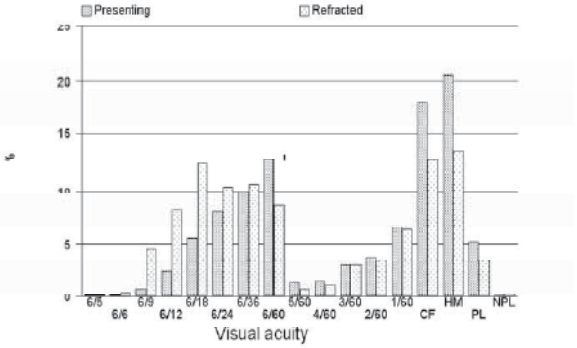
2003



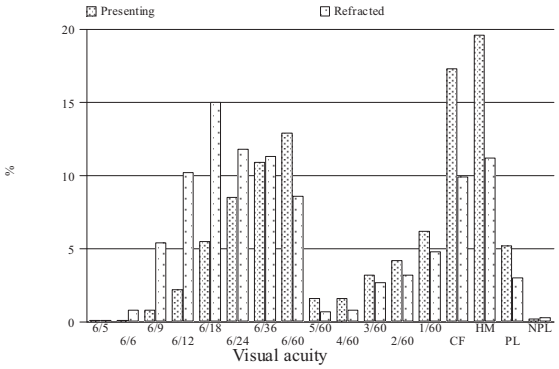
2004



2007



2008



1.2.2.7 Target refractive power

The mean target refractive power in 2008 was -0.1D (SD 0.4), with minimum target power at -9.9D and maximum at +9.9D. These findings in 2007 and 2008 demonstrated that most cataract surgeons participated in CSR aimed to give patient either emmetropic or slightly myopic refraction post-operatively.

Table 1.2.2.7(a): Distribution of Target Refractive Power, CSR 2007-2008

Year	2007	2008
Operated eye (N)	11876	15083
Mean	-0.5	-0.1
SD	0.4	0.4
Median	-0.5	-0.5
Minimum	-9.0	-9.9
Maximum	+5.0	+9.5

Table 1.2.2.7(b): Distribution of Target Refractive Power, CSR 2007-2008

Year	2007		2008	
Target refractive power (Dioptres)	Operated eye N=11876		Operated eye N=15083	
	No.	%	No.	%
-10-<(-9.5)	0	0	1	0
-9.5-<(-9)	2	0	1	0
-9-<(-8.5)	0	0	1	0
-8.5-<(-8)	1	0	1	0
-8-<(-7.5)	2	0	3	0
-7.5-<(-7)	1	0	0	0
-7-<(-6.5)	3	0	1	0
-6.5-<(-5)	1	0	2	0
-5-<(-4.5)	3	0	4	0
-4.5-<(-4)	1	0	3	0
-4-<(-3.5)	7	0.1	8	0.1
-3.5-<(-3)	6	0.1	7	0
-3-<(-2.5)	12	0.1	22	0.1
-2.5-<(-2)	26	0.2	21	0.1
-2-<(-1.5)	77	0.6	48	0.3
-1.5-<(-1)	414	3.5	373	2.5
-1-<(-0.5)	4299	36.2	6151	40.8
-0.5-<0	6077	51.2	7480	49.6
0-<0.5	821	6.9	731	4.8
0.5-<1	91	0.8	158	1
1-<1.5	8	0.1	31	0.2
1.5-<2	5	0	14	0.1
2-<2.5	13	0.1	10	0.1
2.5-<3	1	0	6	0
3-<3.5	1	0	2	0
3.5-<4	0	0	2	0
4-<4.5	2	0	0	0
4.5-<5	1	0	1	0
5-<5.5	1	0	0	0
5.5-<6	0	0	0	0
6-<6.5	0	0	0	0

Year	2007		2008	
6.5-<7	0	0	0	0
7-**<7.5**	0	0	0	0
7.5-<8	0	0	0	0
8-<8.5	0	0	0	0
8.5-<9	0	0	0	0
9-<9.5	0	0	0	0
9.5-10	0	0	1	0

Values outside the +10 and -10 D were excluded from analysis as they would skew the Mean

1.3 CATARACT SURGICAL PRACTICES

1.3.1 Number of Cataract Surgeries Registered by SDP, CSR 2002-2008

Data from both the annual census and CSR showed that majority of SDP performed between 100 to 501 cataract surgery.

Table 1.3.1: Range of Cataract Surgeries Registered by SDP per year, CSR 2002-2008

Year	**2002**		**2003**		**2004**		**2007**		**2008**	
Number of SDP	29	25	31	32	32	33	33	32	36	36*
	Census	CSR	Census	CSR	Census	CSR	Census	CSR	Census	CSR
<100*	4	1	1	5	2	4	1	3	1	1
100-500	13	15	11	10	14	15	15	14	15	15
501-1000	7	5	15	14	8	9	8	8	11	11
>1000	5	4	4	3	8	5	9	7	9	9

*Four hospitals had less than 50% ascertainment rate

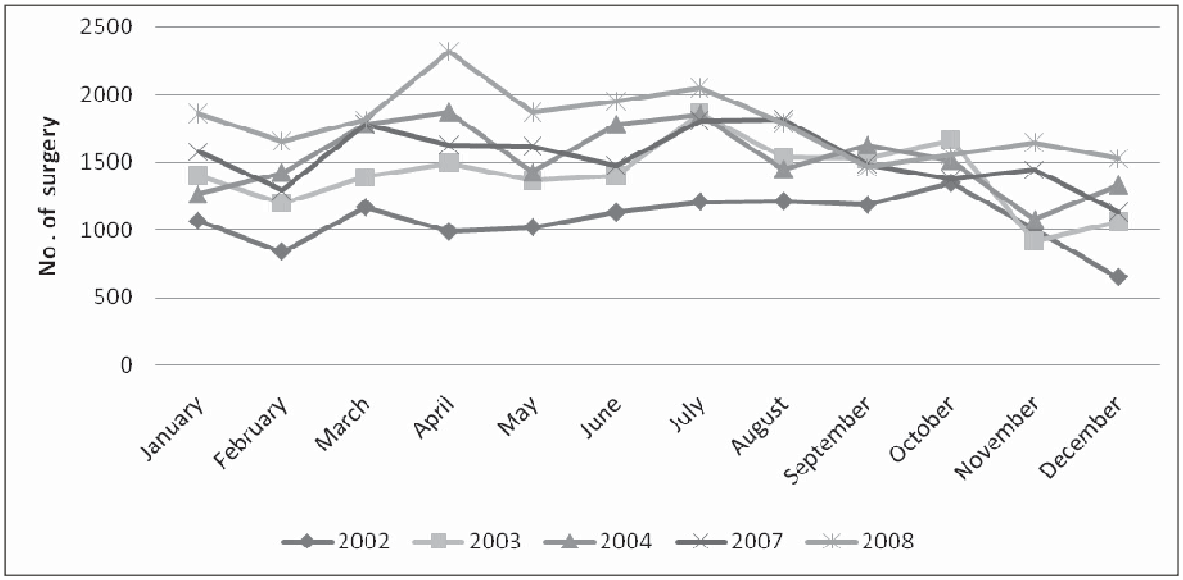
1.3.2 Number of Cataract Surgeries by Month, CSR 2002-2008

The number of cataract surgeries done was lower than average in February and October to December and these patterns remained unchanged. This could be attributed to school holidays, festive seasons and scheduled closure of operating theatres (OT) in MOH hospitals at year-end.

Table 1.3.2: Number of Cataract Surgeries by Month, CSR 2002-2008

Year	**2002**		**2003**		**2004**		**2007**		**2008**	
No of patients (N)	12798		16815		18392		18426		21496	
Month	No	%	No	%	No	%	No	%	No	%
January	1064	8.3	1399	8.3	1265	6.9	1579	8.6	1862	8.7
February	838	6.5	1197	7.1	1424	7.7	1290	7.0	1653	7.7
March	1166	9.1	1389	8.3	1782	9.7	1782	9.7	1812	8.4
April	986	7.7	1495	8.9	1868	10.2	1625	8.8	2321	10.8
May	1018	8.0	1364	8.1	1426	7.8	1618	8.8	1871	8.7
June	1127	8.8	1400	8.3	1778	9.7	1476	8.0	1950	9.1
July	1207	9.4	1862	11.1	1854	10.1	1808	9.8	2049	9.5
August	1210	9.5	1538	9.1	1447	7.9	1814	9.8	1791	8.3
September	1184	9.3	1530	9.1	1626	8.8	1486	8.1	1462	6.8
October	1346	10.5	1666	9.9	1513	8.2	1376	7.5	1552	7.2
November	1003	7.8	917	5.5	1077	5.9	1443	7.8	1646	7.7
December	649	5.1	1058	6.3	1332	7.2	1129	6.1	1527	7.1

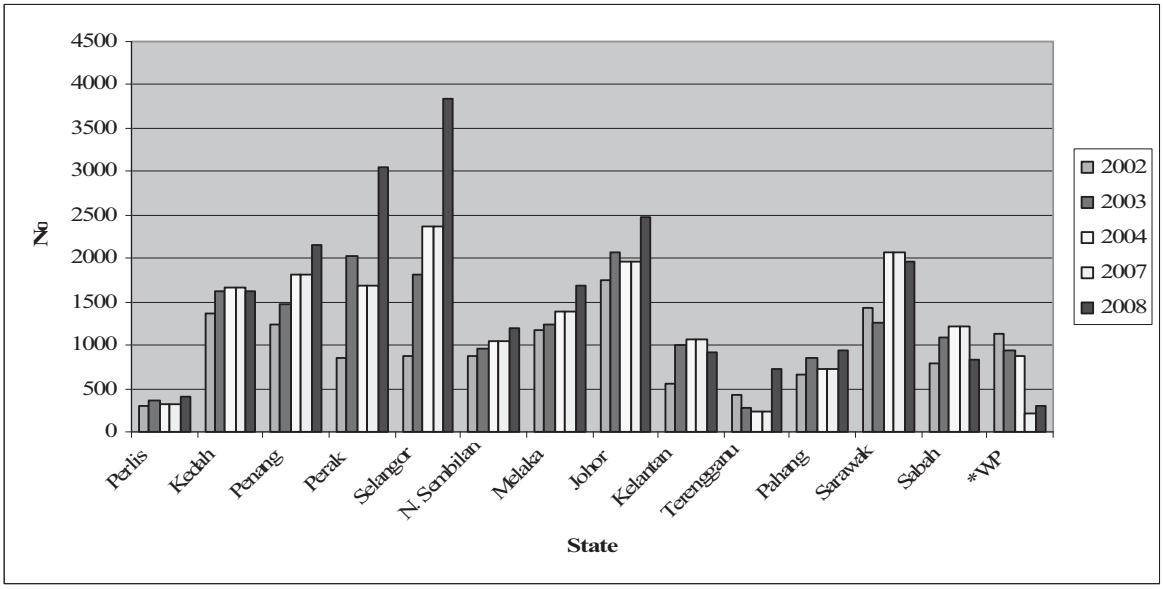
Figure 1.3.2: Number of Cataract Surgeries by Month, CSR 2002-2008



1.3.3 Number of cataract surgeries registered by state

The states which performed high number of cataract surgeries were Selangor, Perak, Johor, Penang and Sarawak.

Figure 1.3.3: Number of Cataract Surgeries Registered to NED by State, CSR 2002-2008



*Wilayah Persekutuan in 2007 and 2008 refer to Putrajaya Hospital only

1.3.4 Surgeon Status

Specialists consistently performed more number of cataract surgeries followed by medical officers and gazetting specialists. This is because the numbers of medical officers and gazetting specialists are much less than the number of specialists. This trend has remained unchanged throughout the years.

Table 1.3.4: Surgeon Status, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No of patients	12798		16815		18392		18426		21496	
	No	%	No	%	No	%	No	%	No	%
Specialist	8763	68.5	12072	71.8	13165	71.6	14327	77.8	16846	78.4
Gazetting Specialist	1762	13.7	1510	9.0	1757	9.6	1276	6.9	1399	6.5
Medical Officer	2273	17.8	3233	19.2	3470	18.8	2690	14.6	2697	12.5
Missing	0	0.0	0	0.0	0	0.0	133	1.0	554	2.6

1.3.5 Duration of surgery

The average time taken to perform a cataract surgery was 40.2 min in 2007 and 38.2 min in 2008. The time taken to do phacoemulsification (34.1 min) could be shortened. The time taken to perform a cataract surgery was not significantly different among specialists, gazetting specialists and medical officers.

Table 1.3.5(a): Duration of Surgery by Types of Cataract Surgery in minutes, CSR 2007-2008

Year	2007		2008	
	Mean	SD	Mean	SD
All eyes	40.2	20.6	38.2	19.6
Phaco	36.8	19.7	34.1	17.7
ECCE	45.3	19.7	45.8	19.5
Phaco → ECCE	57.8	20.6	44.8	24.0
ICCE	57.6	23.7	57.5	23.7
Lens Aspiration	47.8	27.2	60.0	25.6

Data entered with extreme values i.e. more than 3 hours and less than 15 minutes are not being analysed as they would skew the data

Table 1.3.5(b): Duration of Surgery by Surgeon Status, CSR 2007-2008

Year		2007		2008	
		Mean	SD	Mean	SD
Phaco	Specialist	36.0	19.8	35.4	17.9
	Gazetting Specialist	40.2	18.0	47.5	20.8
	Medical Officers	42.2	18.2	49.2	22.8
ECCE	Specialist	40.2	17.6	43.9	69.5
	Gazetting Specialist	45.9	17.8	54.0	71.5
	Medical Officers	53.9	20.2	63.0	89.8

1.3.6 Distribution of cataract surgery performed under day care setting

The rate of day care cataract surgeries were calculated by excluding children and combined surgeries because surgeries done in these patients require general anaesthesia and thus most probably will be done as in-patient surgery.

Though the proportion of cataract surgery performed as day care has increased over the years, but it remained at 40% and the differences were marked among SDPs. In 2008, four SDPs did not do any day care surgery and five SDPs performed more than 90% surgery as day care. As day care surgery saves cost, SDPs should attempt to do more.

Table 1.3.6(a): Distribution of Cataract Surgeries Performed Under Day Care Setting, CSR 2003-2008

Year	2002		2003		2004		2007		2008	
Number of SDPs	25*		32*		33*		32		36	
Total number of cataract surgery registered to CSR	12798		16815		18392		18426		21496	
Number of surgery excluding children and combined surgery	12445		15981		17336		17402		19835	
	No	%	No	%	No	%	No	%	No	%
Number and % of day care surgery excluding children and combined surgery	4887	39.3	6089	38.1	6934	40.0	7297	41.9	8449	42.6

*SDPs in 2002, 2003 and 2004 included private centres and university hospitals

Table 1.3.6(b): Distribution of Cataract Surgery (Excluding Children and Combined Surgery) Performed as Day Care by SDP, CSR 2003-2008

Year	2002		2003		2004		2007		2008*	
	No	%	No	%	No	%	No	%	No	%
All Centres	4887	39.3	6089	38.0	6934	40.0	7297	41.9	8449	42.6
A	218	24	262	26.0	30	70.0	91	1.3	74	8.0
B	-	-	-	-	-	-	3	0.04	181	99.5
C	207	98	519	85.0	85	15.0	317	4.34	311	56.9
E	20	16	139	26.0	24	76.0	82	1.12	25	5.5
F	0	0	0	0.0	2	98.0	-	-	0	0.0
G	1	4	27	3.0	3	97.0	672	9.21	896	58.1
H	10	4	5	2.0	2	98.0	0	0	2	0.5
I	-	-	-	-	-	-	1	0.01	1	3.5
J	14	5	26	5.0	8	92.0	8	0.11	17	2.5
K	-	-	-	-	-	-	0	0	0	0.0
M	1	3	2	1.0	44	56.0	61	0.84	49	19.0
N	206	54	100	41.0	38	62.0	142	2.0	194	28.0
O	875	90	884	92.0	92	8.0	1420	19.5	1483	95.9
P	-	-	NA	-	92	8.0	15	0.2	385	99.7
Q	10	2	0	0.0	4	96.0	2	0.03	0	0.0
R	759	69	759	82.0	82	18.0	960	13.2	1193	91.9
S	26	63	68	79.0	91	9.0	182	2.5	201	81.7
U	NA	NA	733	84.0	88	12.0	1011	13.9	995	78.8
V	-	-	-	-	-	-	313	4.29	382	57.4
W	0	0	0	0.0	0	100.0	0	0	1	0.4
X	-	-	-	-	-	-	10	0.14	45	13.1
Y	-	-	-	-	-	-	1	0.01	8	4.6
Z	100	10	47	6.0	4	96.0	48	0.7	44	3.3
AA	-	-	-	-	-	-	99	1.4	230	74.4
AB	48	12	130	24.0	3	97.0	5	0.1	2	0.4
AC	34	8	175	52.0	32	68.0	54	0.7	46	12.7
AD	0	0	1	0.4	1	99.0	1	0.01	0	0.0
AE	207	54	166	28.0	11	89.0	2	0.03	66	11.5
AF	-	-	-	-	-	-	1	0.01	5	1.0
AH	21	3	8	1.0	2	98.0	11	0.2	22	1.9
AI	345	44	390	53.0	57	43.0	589	8.07	399	69.3
AJ	578	83	544	88.0	87	13.0	863	11.8	893	93.6

D, L, T and AG were excluded due to low ascertainment rates

Figure 1.3.6(a): Distribution of Cataract Surgery Performed as Day Care by SDP, CSR 2008

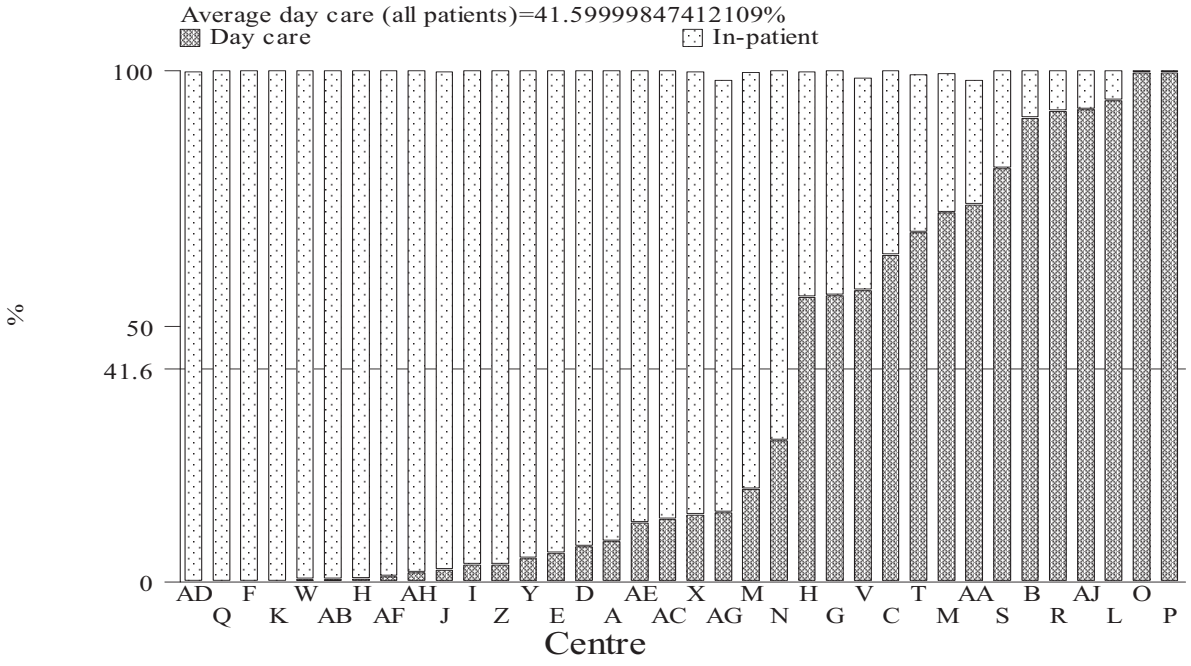


Figure 1.3.6(b): Distribution of Cataract Surgery Performed as Day Care and In-patient by SDP (Excluding Surgery Done in Children and Combined Surgery), CSR 2008

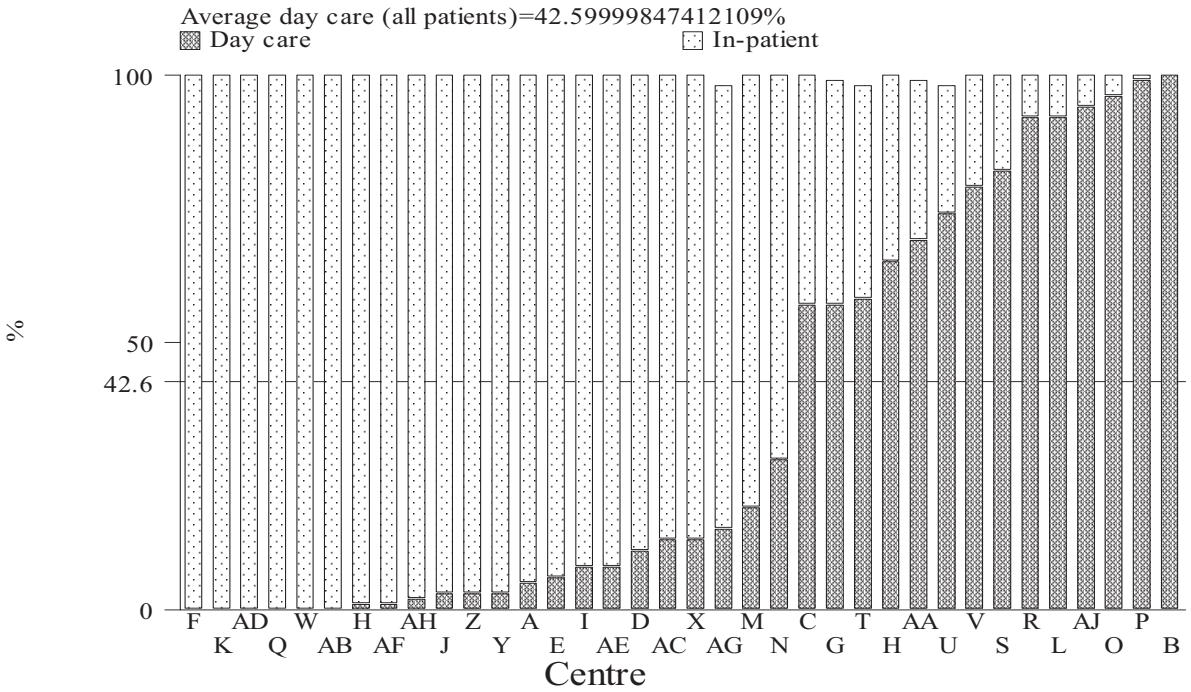
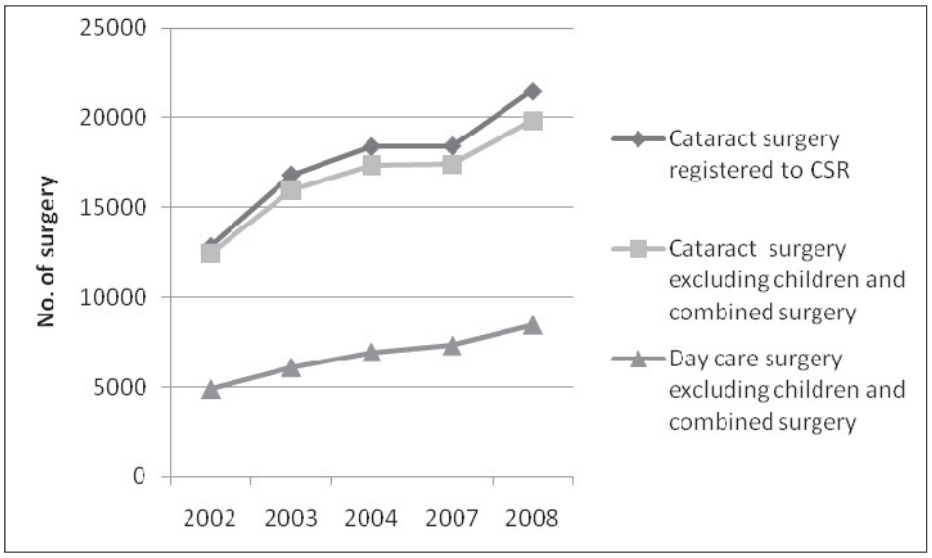


Figure 1.3.6(c): Distribution of Cataract Surgeries Performed as Day Care all SDPs (Excluding Surgery Done in Children and Combined Surgery), CSR 2002-2008



1.3.7 Distribution of types of cataract surgery

There is an increasing shift from extracapsular cataract extraction (ECCE) to phaco as the more common type of surgery performed. The rate of phaco converted to ECCE, a proxy indicator for competency in performing phaco, stayed constant over the years.

In general, all SDPs demonstrated an increasing trend of phaco (except Hospital E, N and AD). There was no phaco surgery performed in Hospital F and Hospital I.
In general, all SDPs demonstrated a decreasing trend of ECCE (except Hospital E and AD).

Table 1.3.7(a): Distribution of Types of Cataract Surgery, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No of patients (N)	12798		16815		18392		18426		21496	
	No	%	No	%	No	%	No	%	No	%
Phacoemulsification	5085	39.7	7674	45.6	9282	50.5	11960	65.1	14781	69.1
ECCE	6914	54.0	8012	47.6	7830	42.6	5524	30.1	5627	26.3
Lens Aspiration	372	2.9	435	2.6	550	3.0	323	1.8	340	1.6
Phaco Converted to ECCE	311	2.4	469	2.8	454	2.5	432	2.4	524	2.4
ICCE	81	0.6	94	0.6	103	0.6	141	0.8	129	0.6

Figure 1.3.7 Distribution of type of cataract surgery, CSR 2002-2008

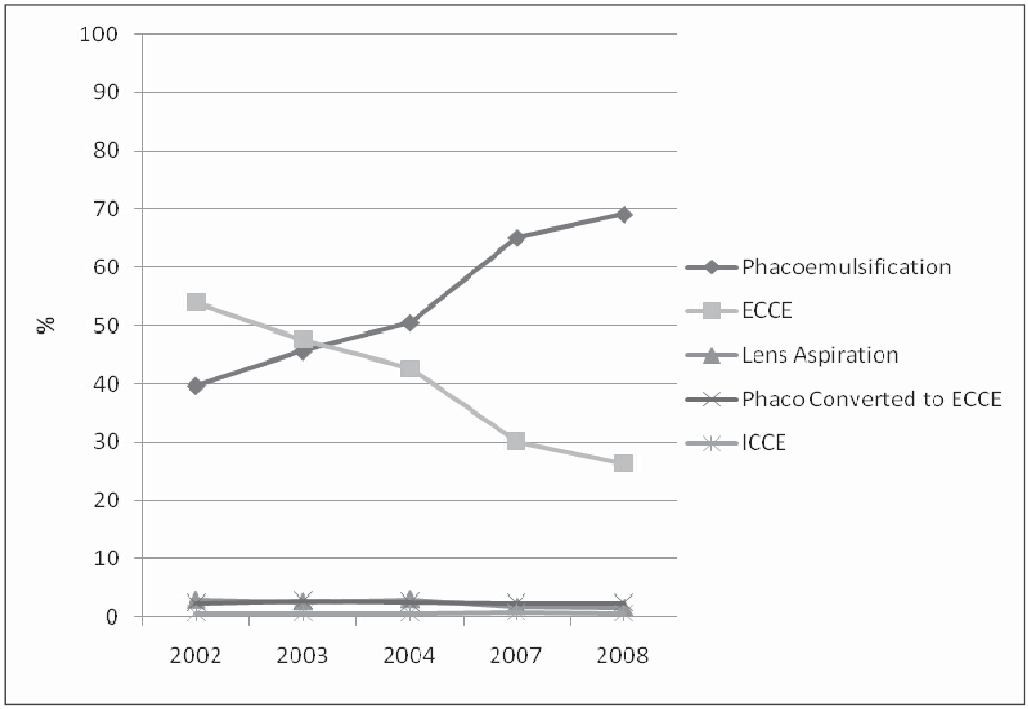


Table 1.3.7(b): Distribution of Types of Cataract Surgery by SDP, CSR 2008

	Type of Cataract Surgery											
	All Surgeries		Phaco		ECCE		Lens Aspiration		Phaco Converted to ECCE		ICCE	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Centres	21496	100	14781	69.1	5627	26.3	340	1.6	524	2.4	129	0.6
A	986	100	715	72.9	247	25.2	2	0.2	16	1.6	1	0.1
B	208	100	75	36.1	106	51	0	0	26	12.5	1	0.5
C	573	100	451	79.1	95	16.7	3	0.5	16	2.8	5	0.9
E	487	100	163	33.5	315	64.7	5	1	4	0.8	0	0
F	137	100	0	0	130	99.2	0	0	1	0.8	0	0
G	1723	100	1434	83.6	240	14	10	0.6	23	1.3	8	0.5
H	400	100	303	75.9	86	21.6	7	1.8	3	0.8	0	0
I	34	100	0	0	33	97.1	1	2.9	0	0	0	0
J	739	100	383	51.8	302	40.9	26	3.5	16	2.2	12	1.6
K	170	100	78	45.9	81	47.6	5	2.9	6	3.5	0	0
M	282	100	58	20.6	190	67.6	3	1.1	30	10.7	0	0
N	726	100	429	59.4	238	33	18	2.5	25	3.5	12	1.7
O	1681	100	1335	80.3	271	16.3	17	1	23	1.4	16	1
P	396	100	296	74.7	95	24	3	0.8	2	0.5	0	0
Q	338	100	236	70.7	81	24.3	4	1.2	11	3.3	2	0.6
R	1357	100	1116	82.3	177	13.1	22	1.6	36	2.7	5	0.4
S	256	100	166	64.8	79	30.9	5	2	6	2.3	0	0
U	1429	100	1291	91	70	4.9	18	1.3	32	2.3	8	0.6
V	696	100	521	75	133	19.1	19	2.7	19	2.7	3	0.4
W	263	100	0	0	257	97.7	5	1.9	0	0	1	0.4
X	350	100	111	31.7	233	66.6	1	0.3	3	0.9	2	0.6
Y	180	100	114	63.7	61	34.1	1	0.6	2	1.1	1	0.6
Z	1376	100	1293	94	30	2.2	25	1.8	19	1.4	8	0.6
AA	319	100	271	85.2	25	7.9	4	1.3	17	5.3	1	0.3
AB	633	100	483	76.4	99	15.7	18	2.8	22	3.5	10	1.6
AC	379	100	169	44.6	194	51.2	10	2.6	6	1.6	0	0
AD	317	100	3	1	305	97.1	3	1	3	1	0	0
AE	588	100	358	60.9	193	32.8	13	2.2	23	3.9	1	0.2
AF	531	100	354	67	138	26.1	8	1.5	22	4.2	6	1.1
AH	1217	100	655	53.8	499	41	24	2	28	2.3	11	0.9
AI	898	100	610	68.9	219	24.7	7	0.8	41	4.6	8	0.9
AJ	1011	100	702	69.4	263	26	24	2.4	20	2	2	0.2

D, L, T and AG were excluded due to low ascertainment rate

Table 1.3.7(c): Distribution of Phaco by SDP, CSR 2002-2008

Years	2002		2003		2004		2007		2008	
	No.	%	No.	%	No.	%	No.	%	No.	%
All Centres	5085	40	7674	46	9282	50	11960	65.1	14781	69.1
A	263	28	351	33	467	41	240	58.4	715	72.9
B	-	-	-	-	-	-	3	75	75	36.1
C	-	-	240	39	276	49	453	81.6	451	79.1
E			350	65	529	78	403	59.2	163	33.5
F	0	0	0	0	0	0	NA	NA	0	0
G	22	7	339	32	293	36	1117	71.4	1434	83.6
H	496	46	16	4	35	11	91	28.1	303	75.9
I	-	-	-	-	-	-	-	-	0	0
J	43	20	209	35	259	41	406	49.9	383	51.8
K	-	-	-	-	-	-	0	0	78	45.9
M			2	1	1	1	24	11.4	58	20.6
N	488	66	74	27	70	30	242	46.5	429	59.4
O	255	49	630	61	742	61	1152	75.9	1335	80.3
P	-	-	-	-	-	-	7	46.7	296	74.7
Q	509	45	398	66	277	76	281	80.1	236	70.7
R	273	57	432	46	577	51	751	68.1	1116	82.3
S	96	41	9	10	13	11	93	45.8	166	64.8
U	-	-	671	68	1031	79	1305	92.4	1291	91
V	-	-	-	-	-	-	412	68.1	521	75
W	519	51	1	0	6	2	0	0	0	0
X	-	-	-	-	-	-	14	9.3	111	31.7
Y	-	-	-	-	-	-	64	63.4	114	63.7
Z	133	32	484	57	579	56	1418	91.9	1293	94
AA	-	-	-	-	-	-	121	82.9	271	85.2
AB	153	36	321	58	381	72	410	82.5	483	76.4
AC	1	1	116	34	176	44	100	35.8	169	44.6
AD	205	52	1	0	14	7	0	0	3	1
AE	206	49	470	76	199	43	435	64.8	358	60.9
AF	-	-	-	-	-	-	210	47.3	354	67
AH	19	7	323	46	462	57	570	55	655	53.8
AI	0	0	203	26	420	46	589	61.9	610	68.9
AJ	593	58	377	56	389	44	680	68	702	69.4

D, L, T and AG were excluded due to low ascertainment rate

Table 1.3.7(d): Distribution of ECCE by SDP, CSR 2002-2008

Years	2002		2003		2004		2007		2008	
	No.	%	No.	%	No.	%	No.	%	No.	%
All Centres	6914	54	8012	48	7830	43	5524	30.1	5627	26.3
A	649	68	664	62	603	53	160	38.9	247	25.2
B	-	-	-	-	-	-	1	25	106	51
C			328	53	272	48	83	15	95	16.7
E			135	25	100	15	265	38.9	315	64.7
F	123	95	130	98	119	99	NA	NA	130	99.2
G	261	89	669	63	479	59	396	25.3	240	14
H	513	48	335	92	262	83	223	68.8	86	21.6
I	-	-	-	-	-	-	-	-	33	97.1
J	162	76	323	54	304	48	337	41.4	302	40.9
K	-	-	-	-	-	-	119	95.2	81	47.6
M			161	96	139	96	164	77.7	190	67.6
N	208	28	163	59	121	52	243	46.7	238	33
O	234	45	329	32	404	33	307	20.2	271	16.3
P	-	-	-	-	-	-	7	46.7	95	24
Q	557	49	177	29	69	19	49	14	81	24.3
R	161	34	466	49	486	43	270	24.5	177	13.1
S	123	53	75	86	103	86	104	51.2	79	30.9
U	NA	NA	248	25	197	15	44	3.1	70	4.9
V	-	-	-	-	-	-	151	25	133	19.1
W	449	44	288	93	272	91	372	97.1	257	97.7
X	-	-	-	-	-	-	134	88.7	233	66.6
Y	-	-	-	-	-	-	32	31.7	61	34.1
Z	244	59	326	39	385	37	53	3.4	30	2.2
AA	-	-	-	-	-	-	8	5.5	25	7.9
AB	232	54	187	34	109	21	57	11.5	99	15.7
AC	184	98	196	57	194	48	159	57	194	51.2
AD	176	45	252	96	176	86	196	97.5	305	97.1
AE	183	43	125	20	250	55	222	33.1	193	32.8
AF	-	-	-	-	-	-	210	47.3	138	26.1
AH	219	82	323	46	292	36	403	38.9	499	41
AI	256	98	517	65	435	48	319	33.5	219	24.7
AJ	356	35	229	34	403	45	276	27.6	263	26

D, L, T and AG were excluded due to low ascertainment rate

1.3.8 Distribution of combined surgery

The proportion of cataract surgery which was performed in combination with VR surgery showed an initial exponential rise from 2002 to 2007. However, the percentage reduced sharply in 2008. The percentage when it was combined with filtering surgery was reduced in 2004 than plateaued and levelled off for 2007 and 2008. Cataract surgery combined with penetrating keratoplasty remained infrequently performed over the years.

Table 1.3.8(a): Distribution of Combined Surgery for all SDPs, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No of patients (N)	12798		16815		18392		18426		21496	
	No	%	No	%	No	%	No	%	No	%
All types of combined surgeries	375	2.9	581	3.4	733	4.9	891	4.8	664	3.1
Specific types of combined surgery										
Pterygium Surgery	86	0.7	120	0.7	147	0.8	135	0.7	94	0.4
Filtering Glaucoma Surgery	148	1.2	210	1.2	235	1.3	131	0.7	142	0.7
Vitreoretinal Surgery	26	0.2	100	0.6	186	1.0	435	2.4	237	1.1
Penetrating Keratoplasty	1	0.007	0	0.0	3	0.02	0	0.0	3	0
Others	124	1.0	170	1.0	149	0.8	190	1.0	188	0.9

Figure 1.3.8(a): Distribution of Combined Surgery for all SDPs, CSR 2002-2008

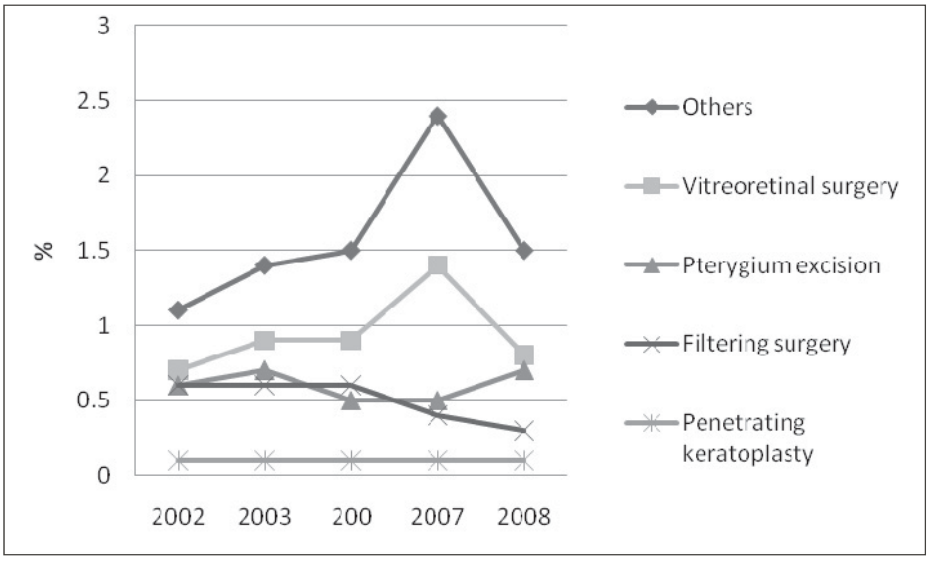


Table 1.3.8(b): Distribution of Combined Surgery by SDP, CSR 2008

	Combined Surgery											
	All Surgeries	All Combined Surgery		Pterygium Surgery		Filtering Surgery		Vitreoretinal Surgery		Penetrating Keratoplasty		Others	
	No	No	%	No	%	No	%	No	%	No	%	No	%
All Centres	21496	664	3.1	94	0.4	142	0.7	237	1.1	3	0	188	0.9
A	986	51	5.2	8	0.8	2	0.2	21	2.1	0	0	20	2
B	208	2	1	1	0.5	0	0	0	0	0	0	1	0.5
C	573	19	3.3	10	1.7	8	1.4	0	0	0	0	1	0.2
E	487	0	0	0	0	0	0	0	0	0	0	0	0
F	137	14	10.2	4	2.9	6	4.4	0	0	0	0	4	2.9
G	1723	40	2.3	3	0.2	26	1.5	1	0.1	0	0	10	0.6
H	400	10	2.5	0	0	0	0	0	0	0	0	10	2.5
I	34	1	2.9	0	0	1	2.9	0	0	0	0	0	0
J	739	52	7	3	0.4	11	1.5	20	2.7	0	0	18	2.4
K	170	2	1.2	0	0	0	0	0	0	0	0	2	1.2
M	282	16	5.7	2	0.7	6	2.1	0	0	0	0	8	2.8
N	726	27	3.7	12	1.7	4	0.6	4	0.6	0	0	7	1
O	1681	57	3.4	1	0.1	31	1.8	16	1	0	0	9	0.5
P	396	4	1	2	0.5	0	0	0	0	0	0	2	0.5
Q	338	5	1.5	0	0	0	0	1	0.3	0	0	4	1.2
R	1357	24	1.8	3	0.2	12	0.9	1	0.1	0	0	8	0.6
S	256	1	0.4	0	0	0	0	0	0	0	0	1	0.4
U	1429	135	9.4	0	0	11	0.8	109	7.6	1	0.1	14	1
V	696	23	3.3	2	0.3	2	0.3	1	0.1	0	0	18	2.6
W	263	6	2.3	1	0.4	1	0.4	0	0	0	0	4	1.5
X	350	1	0.3	0	0	1	0.3	0	0	0	0	0	0
Y	180	1	0.6	0	0	0	0	0	0	0	0	1	0.6
Z	1376	1	0.1	1	0.1	0	0	0	0	0	0	0	0
AA	319	2	0.6	0	0	0	0	0	0	0	0	2	0.6
AB	633	3	0.5	2	0.3	0	0	0	0	0	0	1	0.2
AC	379	10	2.6	5	1.3	2	0.5	0	0	0	0	3	0.8
AD	317	19	6	8	2.5	0	0	0	0	0	0	11	3.5
AE	588	2	0.3	2	0.3	0	0	0	0	0	0	0	0
AF	531	12	2.3	8	1.5	0	0	0	0	0	0	4	0.8
AH	1217	21	1.7	0	0	4	0.3	12	1	0	0	5	0.4
AI	898	20	2.2	2	0.2	6	0.7	11	1.2	0	0	1	0.1
AJ	1011	24	2.4	7	0.7	3	0.3	7	0.7	2	0.2	5	0.5

D, L, T and AG were excluded due to low ascertainment rates

1.3.9 Anaesthesia in cataract surgery

The number of patients who were being operated under local anaesthesia has increased over the years. The preferred type of local anaesthesia was subtenon injection. However, there was an increase in the usage of topical anaesthesia. The use of peribulbar, retrobulbar and facial block injection for anaesthesia as well as combined LA has decreased over the years.

Table 1.3.9(a): Types of Anaesthesia all SDPs, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No of patients (N)	12798		16815		18392		18426		21496	
	No	%	No	%	No	%	No	%	No	%
General anaesthesia	818	6.4	1136	7.0	1379	7.3	1207	6.6	1223	5.7
Local anaesthesia	11980	93.6	15679	93.2	17013	92.5	17143	93.4	20188	94.3
Type of local anaesthesia										
Subtenon	5647	47.1	8076	51.5	9260	54.4	9990	58.3	11014	54.6
Topical	1406	11.7	2819	18.0	3978	23.4	4853	28.3	6680	33.1
Peribulbar	2601	21.7	2575	16.4	2940	1.3	1282	7.5	1227	6.1
Retrobulbar	3100	25.9	2952	18.8	2186	12.8	1031	6.0	1182	5.9
Intracameral	NA	NA	NA	NA	NA	NA	249	1.5	710	3.5
Subconjunctival	28	0.2	141	0.9	139	0.8	232	1.4	251	1.2
Facial block	1348	11.3	865	5.5	226	1.3	20	0.1	143	0.7
Others	12	0.1	0	0.0	1	0.0	223	1.3	NA	NA
Combined local anaesthesia	1983	16.6	1685	10.7	1678	9.9	497	2.9	537	2.7
Types of sedation for patients under LA										
No sedation	7507	62.7	12021	76.7	14031	82.5	9668	56.4*	11234	55.6
Oral sedation alone	3995	33.3	3354	21.4	2729	16.0	2387	13.9	2923	14.5
Intravenous alone	108	0.9	91	0.6	144	0.8	72	0.4	37	0.2
Intravenous plus oral	83	0.7	53	0.3	15	0.1	0.0	0.0	NA	NA
Intramuscular	426	3.6	261	1.7	104	0.6	3.0	0.02	121	0.6

*There was a significant percentage of missing values in sedation for 2007; these missing values may be in 'no sedation' category where data were not entered.

Figure 1.3.9: Types of Anaesthesia by All SDPs, CSR 2002-2008

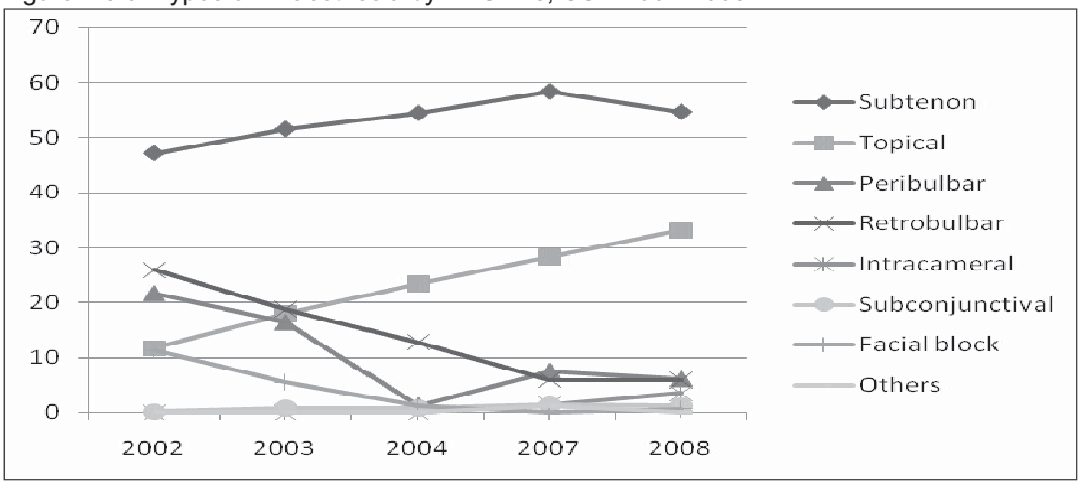


Table 1.3.9(b): Types of Anaesthesia by SDPs, CSR 2008

	Types of Anaesthesia				
		General		Local	
	N	No.	%	No.	%
All Centres	21496	1223	5.7	20188	94.3
A	986	83	8.5	898	91.5
B	208	1	0.5	207	99.5
C	573	2	0.3	570	99.7
E	487	24	5	459	95
F	137	5	3.7	131	96.3
G	1723	82	4.8	1640	95.2
H	400	4	1	395	99
I	34	4	11.8	30	88.2
J	739	62	8.4	677	91.6
K	170	5	3	164	97
M	282	5	1.8	276	98.2
N	726	30	4.1	696	95.9
O	1681	62	3.7	1604	96.3
P	396	3	0.8	391	99.2
Q	338	7	2.1	331	97.9
R	1357	97	7.1	1260	92.9
S	256	19	7.4	237	92.6
U	1429	38	2.7	1368	97.3
V	696	37	5.3	659	94.7
W	263	15	5.7	247	94.3
X	350	6	1.7	344	98.3
Y	180	31	17.2	149	82.8
Z	1376	34	2.5	1333	97.5
AA	319	72	22.7	245	77.3
AB	633	30	4.7	602	95.3
AC	379	73	19.3	306	80.7
AD	317	8	2.5	308	97.5
AE	588	22	3.8	564	96.2
AF	531	13	2.5	516	97.5
AH	1217	129	10.6	1087	89.4
AI	898	60	6.7	831	93.3
AJ	1011	43	4.3	966	95.7

D, L, T and AG were excluded due to low ascertainment rates

Table 1.3.9(c): Types of Local Anaesthesia by SDPs, CSR 2008

	Local Anaesthesia																
	All	Retrobulbar		Peribulbar		Subtenon		Sub-conjunctival		Facial block		Topical		Intracameral		Combined	
	No	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
All Centres	20188	1182	5.9	1227	6.1	11014	54.6	251	1.2	143	0.7	6680	33.1	710	3.5	537	2.7
A	898	625	69.6	1	0.1	109	12.1	11	1.2	0	0	95	10.6	1	0.1	0	0
B	207	1	0.5	0	0	162	78.3	0	0	1	0.5	64	30.9	24	11.6	13	6.3
C	570	0	0	0	0	567	99.5	0	0	0	0	0	0	0	0	0	0
E	459	1	0.2	154	33.6	294	64.1	0	0	0	0	2	0.4	4	0.9	2	0.4
F	131	43	32.8	78	59.5	0	0	0	0	108	82.4	12	9.2	1	0.8	1	0.8
G	1640	3	0.2	1	0.1	921	56.2	146	8.9	3	0.2	594	36.2	527	32.1	435	26.5
H	395	4	1	0	0	389	98.5	1	0.3	0	0	0	0	0	0	0	0
I	30	11	36.7	0	0	0	0	0	0	11	36.7	28	93.3	0	0	0	0
J	677	1	0.1	1	0.1	672	99.3	0	0	0	0	1	0.1	0	0	0	0
K	164	0	0	0	0	142	86.6	0	0	0	0	9	5.5	24	14.6	10	6.1
M	276	1	0.4	1	0.4	270	97.8	4	1.4	0	0	1	0.4	0	0	0	0
N	696	6	0.9	0	0	590	84.8	14	2	0	0	99	14.2	0	0	0	0
O	1604	1	0.1	0	0	463	28.9	0	0	4	0.2	1233	76.9	0	0	0	0
P	391	2	0.5	0	0	352	90	1	0.3	0	0	12	3.1	0	0	0	0
Q	331	0	0	0	0	326	98.5	0	0	0	0	4	1.2	0	0	0	0
R	1260	1	0.1	2	0.2	687	54.5	6	0.5	3	0.2	560	44.4	31	2.5	20	1.6
S	237	0	0	0	0	236	99.6	0	0	0	0	0	0	0	0	0	0
U	1368	202	14.8	3	0.2	174	12.7	3	0.2	0	0	981	71.7	13	1	0	0
V	659	0	0	12	1.8	375	56.9	5	0.8	0	0	247	37.5	36	5.5	17	2.6
W	247	9	3.6	144	58.3	96	38.9	0	0	1	0.4	0	0	0	0	0	0
X	344	3	0.9	1	0.3	133	38.7	4	1.2	1	0.3	201	58.4	6	1.7	4	1.2
Y	149	129	86.6	0	0	0	0	20	13.4	1	0.7	0	0	0	0	0	0
Z	1333	3	0.2	0	0	801	60.1	6	0.5	3	0.2	501	37.6	0	0	0	0
AA	245	0	0	0	0	221	90.2	1	0.4	0	0	15	6.1	0	0	0	0
AB	602	0	0	0	0	591	98.2	3	0.5	0	0	0	0	22	3.7	22	3.7
AC	306	0	0	33	10.8	166	54.2	0	0	0	0	102	33.3	0	0	0	0
AD	308	0	0	0	0	303	98.4	0	0	0	0	0	0	0	0	0	0
AE	564	2	0.4	0	0	406	72	0	0	0	0	152	27	0	0	0	0
AF	516	0	0	0	0	429	83.1	0	0	0	0	103	20	0	0	0	0
AH	1087	4	0.4	261	24	297	27.3	2	0.2	0	0	566	52.1	0	0	0	0
AI	831	27	3.2	483	58.1	294	35.4	15	1.8	4	0.5	102	12.3	5	0.6	3	0.4
AJ	966	3	0.3	7	0.7	254	26.3	7	0.7	3	0.3	733	75.9	11	1.1	10	1

- Number or Percentage may be more than total or 100% as patient might have been given more than one type of local anaesthesia
- D, L, T and AG were excluded due to low ascertainment rates

Table 1.3.9(d): Subtenon Anaesthesia by SDPs, CSR 2002-2008

Years	2002		2003		2004		2007		2008	
	No.	%	No.	%	No.	%	No.	%	No.	%
All Centres	5647	47.0	8076	52.0	9260	54.0	9990	58.3	11014	54.6
A	86	9.0	101	10.0	394	37.0	35	9.5	109	12.1
B	-	-	-	-	-	-	3	75	162	78.3
C			599	99.0	556	99.0	545	99.6	567	99.5
E	-	-	371	73.0	405	66.0	422	69.5	294	64.1
F	0	0.0	0	0.0			NA	NA	0	0
G	283	99.0	627	68.0	463	64.0	702	47.1	921	56.2
H	604	60.0	344	100.0	294	99.0	313	98.4	389	98.5
I	-	-	-	-	-	-	-	-	0	0
J	212	100.0	558	99.0	577	99.0	726	99.2	672	99.3
K	-	-	-	-	-	-	115	100	142	86.6
M	-	-	24	15.0	55	39.0	208	99.5	270	97.8
N	98	14.0	140	59.0	120	63.0	419	85.2	590	84.8
O	507	99.0	400	41.0	531	47.0	443	30.1	463	28.9
P	-	-	-	-	2	1.0	1	6.3	352	90
Q	1004	95.0	585	100.0	350	99.0	166	49.7	326	98.5
R	2	0.0	883	99.0	1036	99.0	967	97.6	687	54.5
S	2	1.0	73	95.0	112	100.0	188	98.9	236	99.6
U	-	-	467	49.0	350	28.0	152	11.1	174	12.7
V	-	-	-	-	-	-	522	91.7	375	56.9
W	76	8.0	25	9.0	23	8.0	33	9.6	96	38.9
X	-	-	-	-	-	-	136	92.5	133	38.7
Y	-	-	-	-	-	-	0	0	0	0
Z	3	1.0	40	5.0	197	21.0	1103	74	801	60.1
AA	-	-	-	-	-	-	98	80.3	221	90.2
AB	344	85.0	1	0.0	193	37.0	472	99	591	98.2
AC	0	0.0	240	74.0	216	58.0	156	71.2	166	54.2
AD	200	54.0	2	1.0	68	34.0	195	100	303	98.4
AE	47	12.0	184	33.0	249	57.0	190	28.6	406	72
AF	-	-	-	-	-	-	390	94.4	429	83.1
AH	207	90.0	582	95.0	546	80.0	468	57.1	297	27.3
AI	0	0.0	175	25.0	215	26.0	210	24.1	294	35.4
AJ	510	53.0	292	46.0	616	73.0	404	42.7	254	26.3

D, L, T and AG were excluded due to low ascertainment rates

Table 1.3.9(e): Topical Anaesthesia by SDPs, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
	No.	%	No.	%	No.	%	No.	%	No.	%
All Centres	1406	12.0	2819	18.0	3978	23.0	4853	28.3	6680	33.1
A	7	1.0	1	0.0	72	7.0	1	0.3	95	10.6
B	-	-	-	-	-	-	3	75	64	30.9
C	-	-	0	0.0	-	-	1	0.2	0	0
E	-	-	0	0.0	1	0.0	0	0	2	0.4
F	0	0.0	0	0.0	1	1.0	NA	NA	12	9.2
G	0	0.0	183	20.0	156	21.0	573	38.5	594	36.2
H	33	3.0	0	0.0	-	-	0	0	0	0
I	-	-	-	-	-	-	-	-	28	93.3
J	0	0.0	0	0.0	1	0.0	0	0	1	0.1
K	-	-	-	-	-	-	0	0	9	5.5
M	-	-	0	0.0	-	-	0	0	1	0.4
N	380	54.0	93	39.0	72	38.0	75	15.2	99	14.2
O	0	0.0	568	58.0	600	53.0	1075	73.1	1233	76.9
P	-	-	-	-	80	36.0	0	0	12	3.1
Q	10	1.0	0	0.0	1	0.0	160	47.9	4	1.2
R	92	20.0	4	0.0	-	-	8	0.8	560	44.4
S	-	-	0	0.0	-	-	0	0	0	0
U	-	-	256	27.0	602	47.0	983	71.5	981	71.7
V	-	-	-	-	-	-	33	5.8	247	37.5
W	54	6.0	1	0.0	-	-	0	0	0	0
X	-	-	-	-	-	-	11	7.5	201	58.4
Y	-	-	-	-	-	-	0	0	0	0
Z	0	0.0	9	1.0	197	21.0	359	24.1	501	37.6
AA	-	-	-	-	-	-	27	22.1	15	6.1
AB	62	15.0	94	17.0	111	21.0	0	0	0	0
AC	1	1.0	84	26.0	157	42.0	63	28.8	102	33.3
AD	148	40.0	0	0.0	1	1.0	0	0	0	0
AE	4	1.0	386	69.0	219	50.0	469	70.6	152	27
AF	-	-	-	-	-	-	27	6.5	103	20
AH	0	0.0	0	0.0	-	-	210	25.6	566	52.1
AI	1	0.0	1	0.0	2	0.0	1	0.1	102	12.3
AJ	453	47.0	481	76.0	788	93.0	528	55.8	733	75.9

D, L, T and AG were excluded due to low ascertainment rates

Table 1.3.9(f): Types of Sedation by among Patients Given Local Anaesthesia by SDPs, CSR 2008

	Types of sedation								
	All Local Anaesthesia N	No Sedation		Oral Alone		Intravenous Alone		Intra-Muscular	
		No.	%	No.	%	No.	%	No.	%
All Centres	20188	11234	55.6	2923	14.5	37	0.2	121	0.6
A	898	346	38.5	9	1	1	0.1	0	0
B	207	109	52.7	0	0	0	0	0	0
C	570	567	99.5	1	0.2	0	0	0	0
E	459	82	17.9	356	77.6	0	0	0	0
F	131	2	1.5	0	0	0	0	118	90.1
G	1640	867	52.9	6	0.4	8	0.5	1	0.1
H	395	257	65.1	0	0	0	0	0	0
I	30	0	0	1	3.3	0	0	0	0
J	677	667	98.5	5	0.7	2	0.3	0	0
K	164	150	91.5	11	6.7	0	0	0	0
M	276	5	1.8	97	35.1	0	0	0	0
N	696	667	95.8	2	0.3	14	2	0	0
O	1604	1544	96.3	2	0.1	0	0	0	0
P	391	167	42.7	0	0	0	0	0	0
Q	331	324	97.9	0	0	0	0	0	0
R	1260	19	1.5	1124	89.2	4	0.3	0	0
S	237	206	86.9	1	0.4	0	0	0	0
U	1368	375	27.4	2	0.1	0	0	0	0
V	659	419	63.6	0	0	0	0	0	0
W	247	4	1.6	57	23.1	0	0	1	0.4
X	344	335	97.4	0	0	0	0	0	0
Y	149	142	95.3	0	0	0	0	0	0
Z	1333	936	70.2	212	15.9	0	0	0	0
AA	245	74	30.2	1	0.4	0	0	0	0
AB	602	1	0.2	487	80.9	0	0	0	0
AC	306	51	16.7	20	6.5	0	0	0	0
AD	308	11	3.6	0	0	1	0.3	0	0
AE	564	395	70	158	28	1	0.2	0	0
AF	516	7	1.4	357	69.2	2	0.4	0	0
AH	1087	1056	97.1	2	0.2	3	0.3	0	0
AI	831	345	41.5	5	0.6	1	0.1	1	0.1
AJ	966	919	95.1	0	0	0	0	0	0

- Number or Percentage may be more than total or 100% as patient might have more than one type of local Anaesthesia
- D, L, T and AG were excluded due to low ascertainment rates

Table 1.3.9(g): Oral Sedation by SDPs, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
	No.	%	No.	%	No.	%	No.	%	No.	%
All Centres	3995	33.0	3354	21.0	2729	16	2387	13.9	2923	14.5
A	450	50.0	601	61.0	106	10.0	4	1.1	9	1
B	-	-	-	-	-	-	0	0	0	0
C	-	-	1	0.0	5	1.0	0	0	1	0.2
E			0	0.0	2	0.0	204	33.6	356	77.6
F	0	0.0	0	0.0	-	-	-	-	0	0
G	119	41.0	90	10.0	126	17.0	7	0.5	6	0.4
H	194	19.0	202	59.0	202	68.0	4	1.3	0	0
I	-	-	-	-	-	-	-	-	1	3.3
J	2	1.0	7	1.0	30	5.0	5	0.7	5	0.7
K	-	-	-	-	-	-	3	2.6	11	6.7
M	-	-	5	3.0	24	17.0	99	47.4	97	35.1
N	2	0.0	9	4.0	-	-	16	3.3	2	0.3
O	3	1.0	3	0.0	6	1.0	0	0	2	0.1
P	-	-	-	-	14	6.0	0	0	0	0
Q	653	61.0	1	0.0	7	2.0	4	1.2	0	0
R	4	1.0	555	62.0	638	61.0	847	85.5	1124	89.2
S	0	0.0	0	0.0	-	-	0	0	1	0.4
U	-	-	19	2.0	10	1.0	13	0.9	2	0.1
V	-	-	-	-	-	-	2	0.4	0	0
W	894	95.0	30	11.0	98	36.0	323	94.2	57	23.1
X	-	-	-	-	-	-	3	2	0	0
Y	-	-	-	-	-	-	0	0	0	0
Z	362	93.0	677	85.0	529	56.0	188	12.6	212	15.9
AA	-	-	-	-	-	-	1	0.8	1	0.4
AB	0	0.0	344	63.0	173	33.0	253	53	487	80.9
AC	173	97.0	1	0.0	1	0.0	7	3.2	20	6.5
AD	0	0.0	24	9.0	27	14.0	0	0	0	0
AE	7	2.0	0	0.0	-	-	0	0	158	28
AF	-	-	-	-	-	-	400	96.9	357	69.2
AH	92	40.0	2	0.0	3	0.0	1	0.1	2	0.2
AI	211	90.0	552	78.0	338	41.0	3	0.3	5	0.6
AJ	1	0.0	1	0.0	6	1.0	0	0	0	0

D, L, T and AG were excluded due to low ascertainment rates

Table 1.3.9(h): Intravenous Sedation by SDPs, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
	No.	%	No.	%	No.	%	No.	%	No.	%
All Centres	108	1.0	91	1.0	144	1.0	72	0.4	37	0.2
A	21	2.0	9	1.0	42	4.0	1	0.3	1	0.1
B	-	-	-	-	-	-	0	0	0	0
C	-	-	0	0.0	1	0.0	0	0	0	0
E			0	0.0	-	-	2	0.3	0	0
F	55	47.0	1	1.0	-	-	-	-	0	0
G	0	0.0	43	5.0	22	3.0	6	0.4	8	0.5
H	12	1.0	0	0.0	-	-	0	0	0	0
I	-	-	-	-	-	-	-	-	0	0
J	0	0.0	0	0.0	-	-	5	0.7	2	0.3
K	-	-	-	-	-	-	0	0	0	0
M	-	-	0	0.0	-	-	0	0	0	0
N	2	0.0	6	3.0	7	4.0	7	1.4	14	2
O	0	0.0	1	0.0	-	-	1	0.1	0	0
P	-	-	-	-	-	-	0	0	0	0
Q	3	0.0	0	0.0	-	-	0	0	0	0
R	0	0.0	4	0.0	7	1.0	3	0.3	4	0.3
S	1	0.0	0	0.0	-	-	0	0	0	0
U	-	-	8	1.0	33	3.0	33	2.4	0	0
V	-	-	-	-	-	-	0	0	0	0
W	2	0.0	2	1.0	2	1.0	1	0.3	0	0
X	-	-	-	-	-	-	0	0	0	0
Y	-	-	-	-	-	-	0	0	0	0
Z	0	0.0	1	0.0	-	-	0	0	0	0
AA	-	-	-	-	-	-	0	0	0	0
AB	0	0.0	2	0.0	-	-	1	0.2	0	0
AC	0	0.0	0	0.0	-	-	0	0	0	0
AD	1	0.0	0	0.0	-	-	0	0	1	0.3
AE	1	0.0	0	0.0	1	0.0	0	0	1	0.2
AF	-	-	-	-	-	-	0	0	2	0.4
AH	3	1.0	0	0.0	7	1.0	11	1.3	3	0.3
AI	0	0.0	1	0.0	6	1.0	1	0.1	1	0.1
AJ	0	0.0	1	0.0	6	1.0	0	0	0	0

D, L, T and AG were excluded due to low ascertainment rates

1.3.10 Intraocular lens implantation

Approximately 98% of patients had IOL implantation. Out of this proportion, 97% had posterior chamber IOL. This trend remained unchanged over the years. The material and type of IOL used in cataract surgery demonstrated a constant shift from PMMA to Acrylic and from non-foldable to foldable. This pattern was consistent with the shift of type of surgery done, from ECCE to phaco. The use of silicone IOL has decreased.

Table 1.3.10(a): Intraocular Lens Implantation, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No of patients (N)	12798		16815		18392		18426		21496	
	No	%	No	%	No	%	No	%	No	%
With IOL	12472	97.5	16396	97.5	17944	97.6	17873	97.0	21115	98.2
Without IOL	326	2.5	419	2.5	448	2.4	553	3.0	375	1.7
Not Available	-		-		-		-		6	0.0
IOL Placement										
No of IOL	12472		16396		17944		17873		21115	
PCIOL	12074	96.8	15957	97.3	17410	97.0	17350	97.1	20342	96.3
ACIOL	386	3.1	404	2.5	497	2.8	482	2.7	454	2.2
Scleral Fixated IOL	11	0.1	34	0.2	34	0.2	35	0.2	36	0.2
Others		0.0		0.0	2	0.0	6	0.0	14	0.1
Not Available /missing	1	0.0	1	0.0	1	0.0	-		269	1.3
Materials of IOL										
No of IOL	12472		16396		17944		17873		21115	
1) Acrylic	1641	13.2	4418	26.9	7105	39.6	11955	66.9	15382	72.8
2) PMMA	9161	73.5	10203	62.2	9758	54.4	5547	31	5300	25.1
3) Silicone	1670	13.4	1776	10.8	1078	6.0	97	0.5	113	0.5
4) Others	0	0.0	4	0.0	12	0.1	74	0.4	19	0.1
4) Not Available/missing	-		1	0.0	-		200	1.1	301	1.4
Types of IOL										
No of IOL	12472		16396		17944		17873		21115	
1) Foldable	3311	26.5	6195	37.8	8186	45.6	11972	67.0	15320	72.6
2) Non foldable	9161	73.5	10201	62.2	9757	54.4	5590	31.3	5316	25.2
3)Not Available/missing	-		-		1	0.0	311	1.7	479	2.3

Figure 1.3.10: Intraocular Lens Implantation, CSR 2002-2008

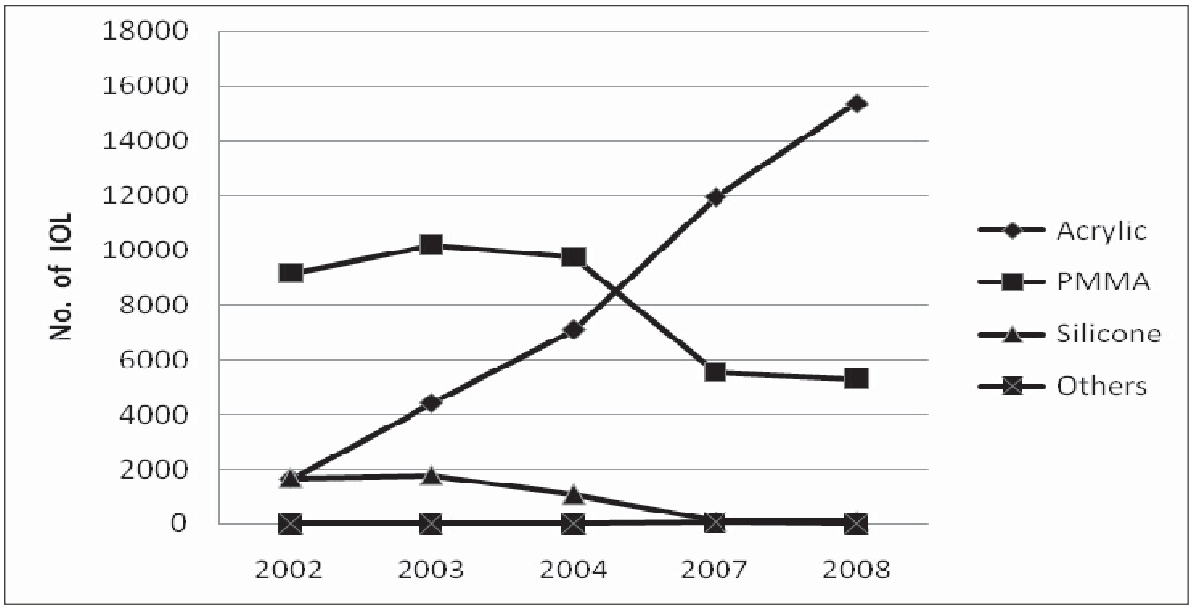


Table 1.3.10(b): Distribution of IOL Placement by SDPs, CSR 2008

	Cataract Surgery With IOL						
		Posterior Chamber IOL		Anterior Chamber IOL		Scleral Fixated IOL	
	N	No.	%	No.	%	No.	%
All Centres	20832	20342	97.6	454	2.2	36	0.2
A	959	953	99.4	6	0.6	0	0
B	207	205	99	2	1	0	0
C	568	555	97.7	13	2.3	0	0
E	476	474	99.6	2	0.4	0	0
F	121	119	98.3	2	1.7	0	0
G	1697	1674	98.6	23	1.4	0	0
H	389	380	97.7	9	2.3	0	0
I	31	31	100	0	0	0	0
J	701	690	98.4	5	0.7	6	0.9
K	163	163	100	0	0	0	0
M	279	269	96.4	10	3.6	0	0
N	685	665	97.1	20	2.9	0	0
O	1638	1589	97	35	2.1	14	0.9
P	385	384	99.7	1	0.3	0	0
Q	335	323	96.4	12	3.6	0	0
R	1320	1294	98	25	1.9	1	0.1
S	246	239	97.2	7	2.8	0	0
U	1345	1311	97.5	34	2.5	0	0
V	677	657	97	20	3	0	0
W	249	241	96.8	8	3.2	0	0
X	345	332	96.2	13	3.8	0	0
Y	171	170	99.4	1	0.6	0	0
Z	1335	1303	97.6	31	2.3	1	0.1
AA	314	306	97.5	8	2.5	0	0
AB	603	582	96.5	21	3.5	0	0
AC	370	365	98.6	5	1.4	0	0
AD	300	291	97	9	3	0	0
AE	588	569	96.8	19	3.2	0	0
AF	511	489	95.7	22	4.3	0	0
AH	1198	1153	96.2	45	3.8	0	0
AI	882	850	96.4	26	2.9	6	0.7
AJ	965	958	99.3	5	0.5	2	0.2

D, L, T and AG were excluded due to low ascertainment rates

1.4 INTRA-OPERATIVE COMPLICATIONS

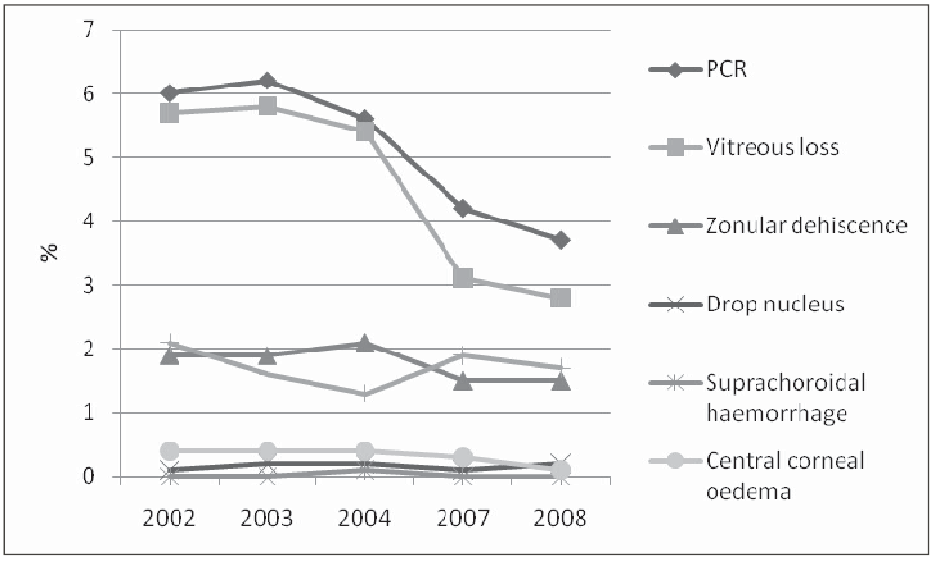
1.4.1 Intra-operative complications by years

There was an improvement in the rate of intra-operative complications in the year 2008. The rate declined to 7.6% from the cumulative rate of 10.4% in the year 2002. The most common type of complication was PCR followed by vitreous loss and zonular dehiscence. The rates of all the specific types of intra-operative complication have decreased over the years.

Table 1.4.1: Distribution of Type of Intra-operative Complications, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No. of patients (N)	12798		16815		18391		18380		21496	
	No.	%	No.	%	No.	%	No.	%	No.	%
Patient with intra-op complication	1328	10.4	1673	9.9	1730	9.4	1999	10.9	1636	7.6
Types of complications										
PCR	773	6.0	1036	6.2	1025	5.6	764	4.2	798	3.7
Vitreous loss	734	5.7	979	5.8	994	5.4	569	3.1	608	2.8
Zonular dehiscence	246	1.9	327	1.9	380	2.1	275	1.5	322	1.5
Drop nucleus	13	0.1	27	0.2	34	0.2	21	0.1	33	0.2
Suprachoroidal haemorrhage	5	0.0	8	0.0	10	0.1	9	0.0	10	0
Central corneal oedema	56	0.4	73	0.4	78	0.4	58	0.3	27	0.1
Others	274	2.1	266	1.6	235	1.3	350	1.9	361	1.7

Figure 1.4.1: Distribution of Specific Type of Intra-operative Complications, CSR 2002-2008



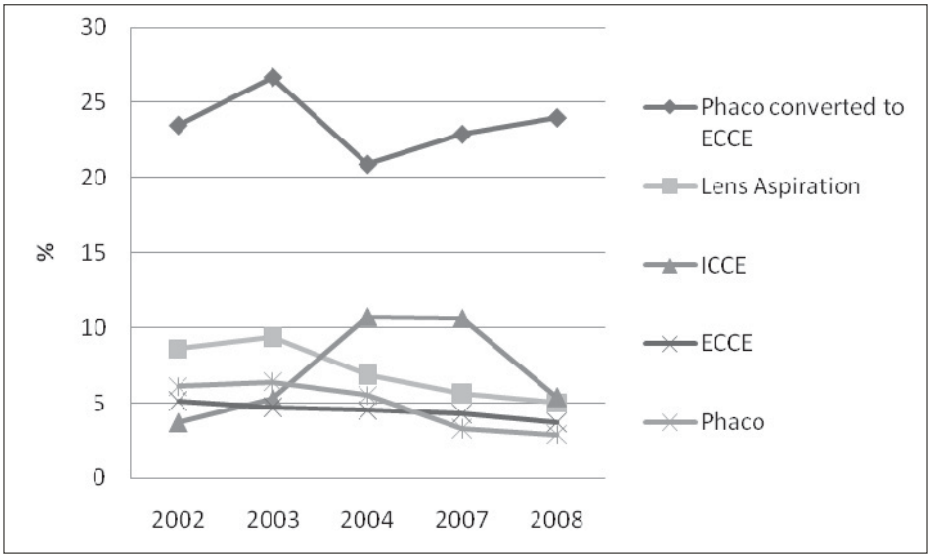
1.4.2 Intra-operative complication by type of surgery

Phacoemulsification demonstrated the lowest rate of intra-operative complication, followed by ECCE and lens aspiration. This pattern remained unchanged since 2002. All these three main types of cataract surgeries showed a declining rate of complication over the years. ICCE produced higher rates of intra-operative complications due to the nature of the surgery. On the other hand, the higher rates of complications in 'phaco converted to ECCE' should be interpreted with caution. The surgery was mainly the result of complicated or failed phaco surgery; therefore the rates of complication could have been contributed partly by the complicated phaco surgery itself.

Table 1.4.2(a): Intra-operative Complications by Types of Cataract Surgery, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
	No	%	No	%	No	%	No	%	No	%
Phaco	438	8.6	667	8.7	747	8.0	969	8.1	753	5.1
Phaco→ ECCE	128	41.2	206	43.9	177	39.0	225	52.1	240	45.8
ECCE	684	9.9	697	8.7	680	8.7	691	12.5	532	9.5
Lens Aspiration	51	13.7	50	11.5	58	10.5	51	15.8	31	9.1
ICCE	27	33.3	39	41.5	50	48.5	63	44.7	60	46.5
Others	-	-	14	10.7	18	10.5	-	-	16	25.8
Missing	-	-	-	-	-	-	9	20.0	4	12.1

Figure1.4.2: Intra-operative Complications by Types of Cataract Surgery, CSR 2002-2008



1.4.3 Intra-operative complications by combined surgery

Consistent with the previous years' findings, the intra-operative complications were higher in combined surgery when compared to cataract surgery alone. PCR and vitreous loss also remained the most common complications encountered.

Higher complication rates were noted when cataract surgeries were combined with VR, filtering surgery or pterygium surgery. There was a significant proportion of PCR, vitreous loss and zonular dehiscence occurring intra-operatively when the surgery was combined with VR surgeries in 2002. However, it did not reveal any specific trend during the following years.

Table 1.4.3(a): Distribution of Intra-operative Complications by Any Combined Surgery, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
	No.	%	No.	%	No.	%	No.	%	No.	%
Number of combined surgery	375	100	581	100	733	100	891	100	664	100
Any intra-operative complication	64	17.1	105	18.1	120	16.4	131	14.7	89	10.0
Types of complications										
PCR	35	9.3	60	10.3	77	10.5	56	6.3	54	6.1
Vitreous loss	46	12.3	66	11.4	72	9.8	41	4.6	40	4.5
Zonular dehiscence	18	4.8	22	3.8	23	3.1	21	2.4	15	1.7
Drop nucleus	3	0.8	5	0.9	5	0.7	4	0.4	3	0.3
Suprachoroidal haemorrhage	0	0.0	0	0.0	4	0.5	0	0.0	0	0.0
Central corneal oedema	1	0.3	10	1.7	4	0.5	7	0.8	3	0.3
Others	12	3.2	18	3.1	16	2.2	30	3.4	14	1.6

Table 1.4.3(b): Distribution of Intra-operative Complications by Specific Combined Surgery, CSR 2008

	All Surgeries		Any Combined Surgery		Pterygium Surgery		Filtering Surgery		Vitreo-Retinal Surgery		Penetrating Keratoplasty		Others	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N	21496	100	664	100	94	100	142	100	237	100	3	100	188	100
Any intra-op complication	1636	7.6	89	10.0	3	3.2	9	6.3	21	8.9	0	0.0	56	29.8
1.Posterior capsule rupture	798	3.7	56	29.8	2	2.1	3	2.1	17	7.2	0	0.0	32	17.0
2.Vitreous loss	608	2.8	32	17	0	0.0	5	3.5	6	2.5	0	0.0	29	15.4
3.Zonular dehiscene	322	1.5	29	15.4	1	1.1	3	2.1	1	0.4	0	0.0	10	5.3
4.Drop nucleus	33	0.2	10	5.3	0	0.0	0	0.0	2	0.8	0	0.0	1	0.5
5.Suprachoroidal haemorrhage	10	0.0	1	0.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6.Central corneal oedema	27	0.1	1	0.5	0	0.0	2	1.4	0	0.0	0	0.0	1	0.5
7.Other	361	1.7	10	5.3	0	0.0	1	0.7	3	1.3	0	0.0	10	5.3

Table 1.4.3(c): Distribution of Intra-operative Complications when Combined with Filtering Surgery, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
N	148		210		235		131		142	
	No	%	No	%	No	%	No	%	No	%
Any intra-op complication	20	14.0	18	9.0	24	10.0	24	18.3	9	6.3
1.Posterior capsule rupture	2	1.0	3	1.0	3	1.0	9	6.9	3	2.1
2.Vitreous loss	11	7.0	7	3.0	14	6.0	7	5.3	5	3.5
3.Zonular dehiscence	3	2.0	1	0.0	1	0.0	4	3.1	3	2.1
4.Drop nucleus	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5.Suprachoroidal haemorrhage	0	0.0	0	0.0	1	0.0	0	0.0	0	0.0
6.Central corneal oedema	0	0.0	3	1.0	1	0.0	3	2.3	2	1.4
7.Others	6	3.0	4	2.0	4	2.0	5	3.8	1	0.7

Table 1.4.3(d): Distribution of Intra-operative Complications when Combined with VR Surgery, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
N	26		100		186		435		237	
	No	%	No	%	No	%	No	%	No	%
Any intra-op complication	9	35.0	24	24.0	25	13.0	45	10.3	21	8.9
1.Posterior capsule rupture	0	0.0	4	4.0	11	6.0	18	4.1	17	7.2
2.Vitreous loss	5	19.0	12	12.0	8	5.0	11	2.5	6	2.5
3.Zonular dehiscence	0	0.0	2	2.0	3	2.0	6	1.4	1	0.4
4.Drop nucleus	1	4.0	2	2.0	3	2.0	3	0.7	2	0.8
5.Suprachoroidal haemorrhage	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6.Central corneal oedema	0	0.0	2	2.0	1	1.0	3	0.7	0	0.0
7.Others	3	12.0	4	4.0	2	1.0	12	2.8	3	1.3

1.4.4 Intra-operative complications by types of local anaesthesia

In general, subconjunctival anaesthesia was associated with higher rates of intra-operative complications except for the year 2002 and 2004. The complications were mainly PCR and vitreous loss. However, the higher rates in these eyes could also be due to the occurrence of complication prompting the use of subconjunctival injection as an additional form of anaesthesia.

Table 1.4.4: Intra-operative Complications by Types of Local Anaesthesia, CSR 2008

	All Local Anaesthesia		Retrobulbar		Peribulbar		Subtenon		Sub-Conjunctival		Facial Block		Topical		Intracameral	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Any intra-op complication	1517	7.5	84	7.0	124	10.0	957	9.0	22	9.0	11	8.0	402	6.0	42	6.0
1.Posterior capsule rupture	745	3.7	39	3.0	39	3.0	468	4.0	13	5.0	5	3.0	227	3.0	19	3.0
2.Vitreous loss	557	2.8	15	1.0	37	3.0	390	4.0	9	4.0	1	1.0	133	2.0	15	2.0
3.Zonular dehiscene	300	1.5	8	1.0	26	2.0	205	2.0	3	1.0	1	1.0	68	1.0	9	1.0
4.Drop nucleus	31	0.2	3	0.0	1	0.0	14	0.0	0	0.0	0	0.0	15	0.0	3	0.0
5.suprachoroidal haemorrhage	10	0.0	0	0.0	0	0.0	8	0.0	0	0.0	0	0.0	2	0.0	0	0.0
6.Central corneal oedema	24	0.1	0	0.0	2	0.0	21	0.0	0	0.0	0	0.0	1	0.0	0	0.0
7.Other	338	1.7	24	2.0	40	3.0	203	2.0	3	1.0	5	3.0	86	1.0	10	1.0

Number or percentage may be more than total or 100% as patient might have more than one intra-operative complication.

1.4.5 Intra-operative complications by surgeon status

Intra-operative complications were highest in surgeries performed by the gazetting specialists. The rates appeared to be increasing. The complications were mainly PCR and vitreous loss. The rates were lower among Medical Officers most probably due to supervision from seniors or trainers during surgery. Although the occurrence of central corneal oedema and significant damage to iris was low among the specialists, the occurrence of other complications was still relatively high. The high rate of complications could be due to more difficult cases being operated by them. This finding required further observation and analysis.

Table 1.4.5(a): Percentage of Intra-operative Complications by Surgeon Status, CSR 2002-2008

(i) Specialist

Year	2003		2004		2007		2008*	
	No	%	No	%	No	%	No	%
Any intra-operative complication	1144	9.5	1170	8.9	1485	10.4	1144	6.8
PCR	199	2.7	180	1.4	546	3.8	538	3.2
Vitreous loss	520	4.3	515	3.9	405	2.8	417	2.5
Zonular dehiscence	151	1.3	163	1.2	204	1.4	232	1.4
Drop nucleus	22	0.2	28	0.2	20	0.1	24	0.1
Suprachoroidal haemorrhage	6	0.1	8	0.1	5	0.03	3	0.02
Central corneal oedema	42	0.4	40	0.3	50	0.35	19	0.11
Others	171	1.4	158	1.2	261	1.82	279	1.66

*551 cases are missing in surgeon status and 3 cases are “Not Available”

(ii) Gazetting Specialist

Year	2003		2004		2007		2008*	
	No	%	No	%	No	%	No	%
Any intra-operative complication	185	12.0	222	13.0	175	13.7	167	11.9
PCR	21	1.0	38	2.0	85	6.7	91	6.5
Vitreous loss	99	8.0	97	7.0	54	4.2	76	5.4
Zonular dehiscence	18	1.0	25	1.0	24	1.9	32	2.3
Drop nucleus	2	0.0	4	0.0	0	0.0	3	0.2
Suprachoroidal haemorrhage	2	0.1	1	0.1	1	0.08	1	0.1
Central corneal oedema	7	0.5	16	0.9	5	0.39	5	0.4
Others	27	1.8	25	1.4	37	2.9	37	2.9

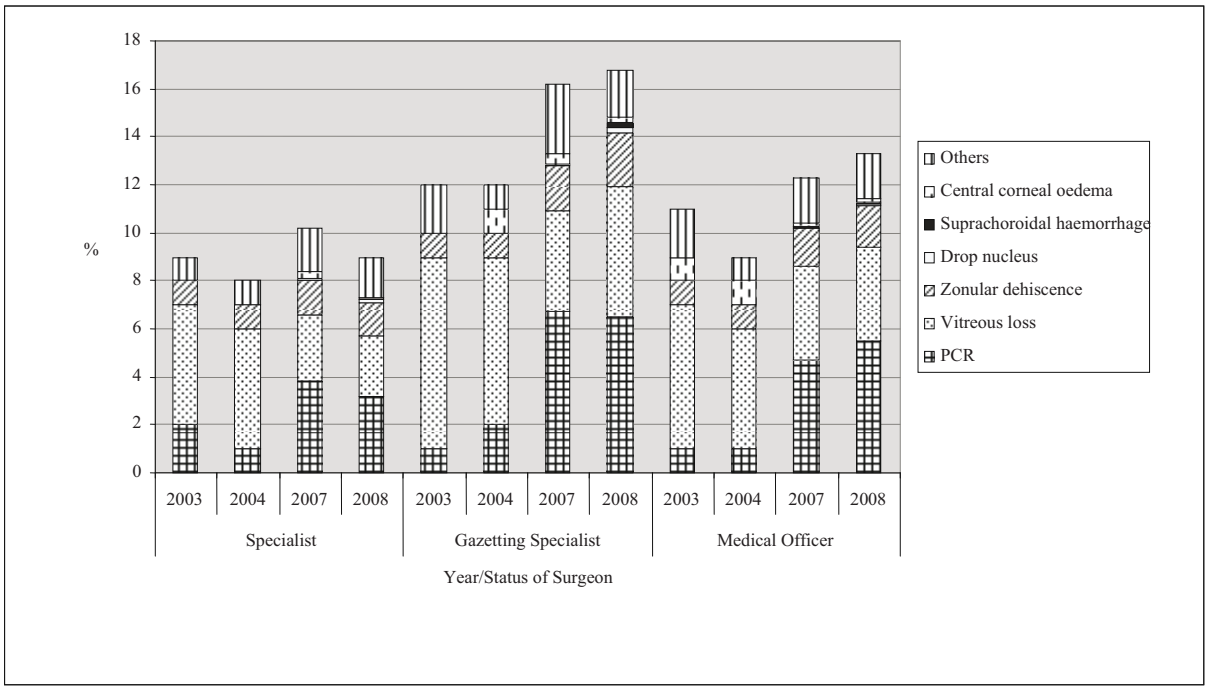
*551 cases are missing in surgeon status and 3 cases are “Not Available”

(iii) Medical Officer

Year	2003		2004		2007		2008*	
	No	%	No	%	No	%	No	%
Any intra-operative complication	344	11.0	338	10.0	330	12.3	264	9.8
PCR	40	1.0	47	1.0	126	4.7	148	5.5
Vitreous loss	157	6.0	148	5.0	105	3.9	105	3.9
Zonular dehiscence	34	1.0	46	1.0	43	1.6	46	1.7
Drop nucleus	3	0.0	2	0.0	1	0.0	4	0.1
Suprachoroidal haemorrhage	0	-	1	0.0	3	0.1	4	0.1
Central corneal oedema	24	0.7	22	0.6	2	0.1	3	0.1
Others	68	2.1	52	1.5	51	1.9	51	1.9

*551 cases are missing in surgeon status and 3 cases are “Not Available”

Figure 1.4.5: Percentage Distribution of Intra-operative Complications by Surgeon Status, CSR 2003-2008



1.4.6 Rate of posterior capsular rupture by SDPs

There is an obvious variation in PCR rates among SDPs. It ranged from 0% to 11.1% in 2007 and from 0.8% to 6.3% in 2008.

Table 1.4.6(a): Rate of PCR by SDPs, CSR 2007-2008

Year	2007			2008		
	No. of surgery	No.	%	No. of surgery	No.	%
A	652	10	1.5	986	29	2.9
B	33	0	0.0	208	3	1.4
C	550	20	3.6	573	14	2.4
E	697	18	2.6	487	8	1.6
F	0	0	0.0	137	3	2.2
G	1556	77	4.9	1723	59	3.4
H	318	8	2.5	400	3	0.8
I	0	0	0.0	34	1	2.9
J	807	38	4.7	739	33	4.5
K	125	2	1.6	170	7	4.1
M	201	4	2.0	282	11	3.9
N	525	34	6.5	726	35	4.8
O	1518	87	5.7	1681	106	6.3
P	18	2	11.1	396	7	1.8
Q	349	4	1.1	338	14	4.1
R	1102	92	8.3	1357	77	5.7
S	199	8	4.0	256	8	3.1
U	1400	47	3.4	1429	56	3.9
V	697	43	6.2	696	36	5.2
W	380	10	2.6	263	9	3.4
X	152	10	6.6	350	11	3.1
Y	100	3	3.0	180	9	5.0
Z	1520	28	1.8	1376	28	2.0
AA	165	9	5.5	319	14	4.4
AB	497	23	4.6	633	14	2.2
AC	278	7	2.5	379	10	2.6
AD	189	5	2.6	317	10	3.2
AE	668	19	2.8	588	16	2.7
AF	443	27	6.1	531	28	5.3
AH	1040	40	3.8	1217	34	2.8
AI	954	40	4.2	898	40	4.5
AJ	998	33	3.3	1011	38	3.8

D, L, T and AG were excluded due to low ascertainment rates

Figure 1.4.6(a): Rate of PCR by SDP, CSR 2007-2008-Bar Chart (National KPI set at < 5%)

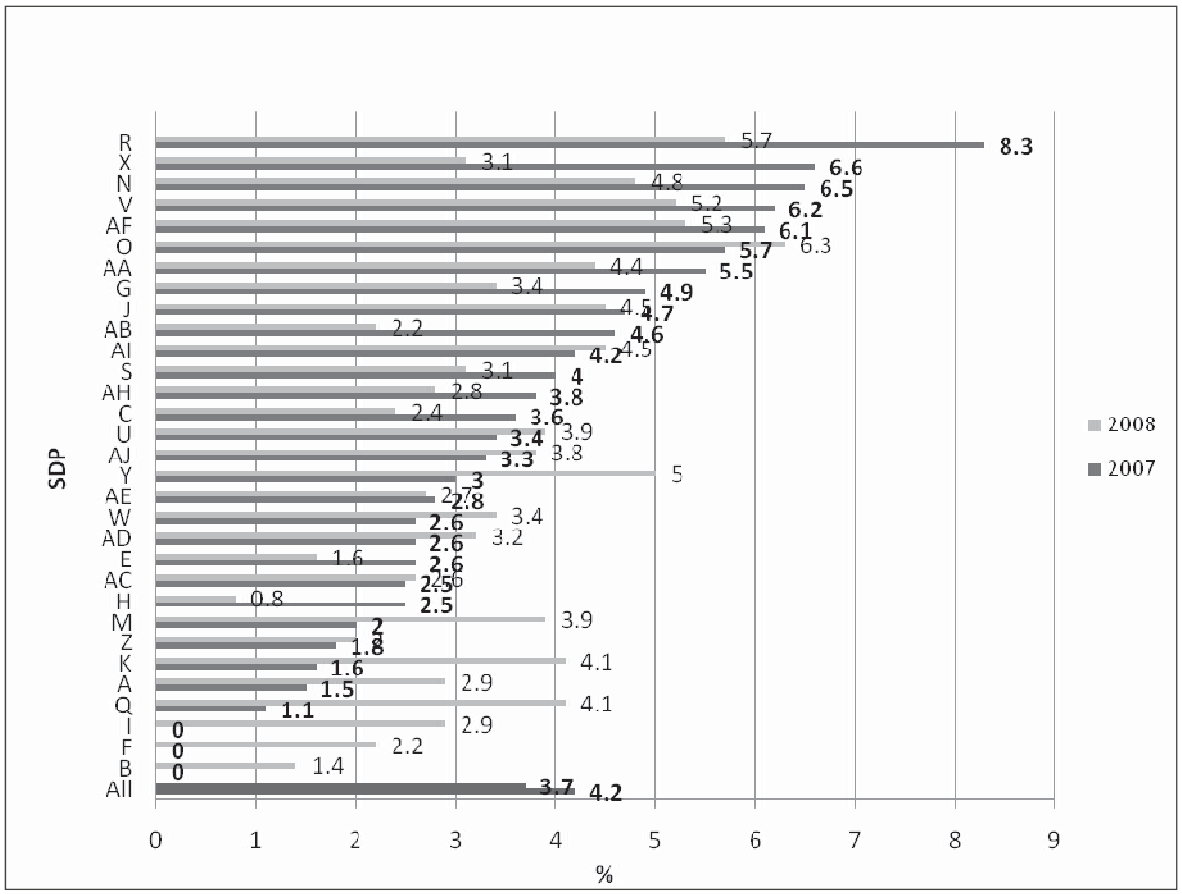
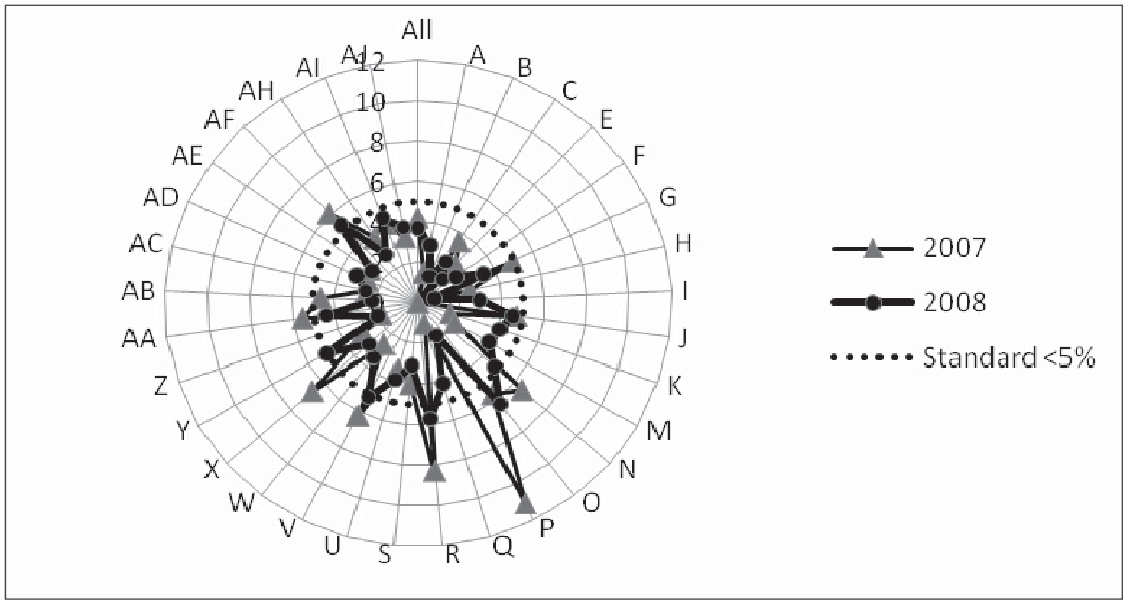


Figure 1.4.6(b): Rate of PCR by SDPs, CSR 2007-2008-Radar Chart (National KPI set at < 5%)



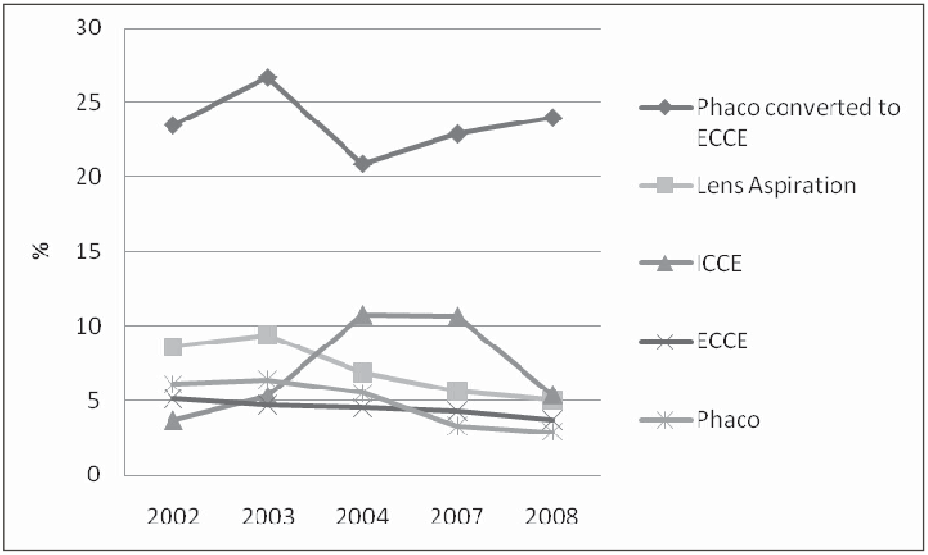
1.4.7 Rate of posterior capsular rupture by type of cataract surgery

In the year 2002 to 2004, the rate of PCR was higher than ECCE, but in 2007 and 2008, phaco has lower rate of PCR than ECCE. This might reflect learning curve among surgeons when they begin to convert from ECCE to phaco surgery in the early 2000s.

Table 1.4.7 Rate of PCR by Type of Cataract Surgery, CSR 2002-2008

Year	2002		2003		2004		2007		2008	
No. of patients (N)	12798		16815		18391		18380		21496	
Total PCR	773		1036		1013		764		790	
	No	%	No	%	No	%	No	%	No	%
Phaco	309	6.1	489	6.4	513	5.5	393	3.3	432	2.9
ECCE	356	5.1	374	4.7	356	4.5	239	4.3	210	3.7
Lens Aspiration	32	8.6	41	9.4	38	6.9	18	5.6	17	5
ICCE	3	3.7	5	5.3	11	10.7	15	10.6	7	5.4
Phaco converted to ECCE	73	23.5	125	26.7	95	20.9	99	22.9	124	24

Figure 1.4.7: Rate of PCR by Type of Cataract Surgery, CSR 2002-2008



1.5 CATARACT SURGERY OUTCOME

1.5.1 Post-operative Complications

Among the patients who were operated on and registered to CSR, all have outcome record submitted in 2002 and 2003 and 95.5% in 2007 and 2008.

Table 1.5.1: Distribution of Cataract Surgery with Post-operative Complication Record, CSR 2002-2008

Year	2002	2003	2004	2007	2008
Total number of cataract surgery registered to CSR	12798	16815	18392	18426	21496
Cataract surgery with post-operative complication record	12798	16815	15996	17604	20521
Percent ascertainment on post-operative complication (%)	100	100	87.0	95.5	95.5

1.5.1.1 Post-operative infectious endophthalmitis

The rate of post-operative infectious endophthalmitis decreased over the years, with 1.1 cases in 1000 cataract surgeries performed in MOH hospitals. This is close to the average international rate of 1 per 1000 cases. The mean duration from the time of surgery to diagnosis of infection for eyes operated in 2007 and 2008 was 3 weeks.

Table 1.5.1.1(a): Rate of Post-operative Infectious Endophthalmitis, CSR 2002-2008

Year	2002	2003	2004	2007	2008
Cataract surgery with post-operative complication records (N)	12798	16815	15996	17604	20521
Cataract surgery with post-operative infectious endophthalmitis (n)	25	41	25	37	22
Percentage of cataract surgery with post-operative endophthalmitis (%)	0.20	0.24	0.16	0.21	0.11

Figure 1.5.1.1 (a): Rate of Post-operative Infectious Endophthalmitis, CSR 2002-2008

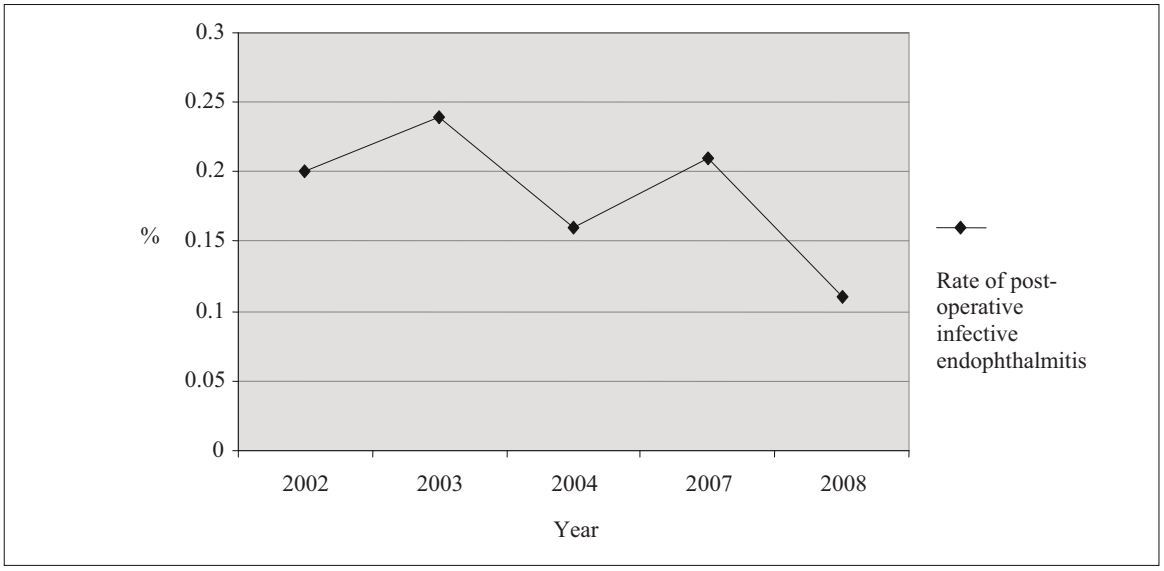


Figure 1.5.1.1(b): Rate of Post-operative Infectious Endophthalmitis, by SDP CSR 2007-2008

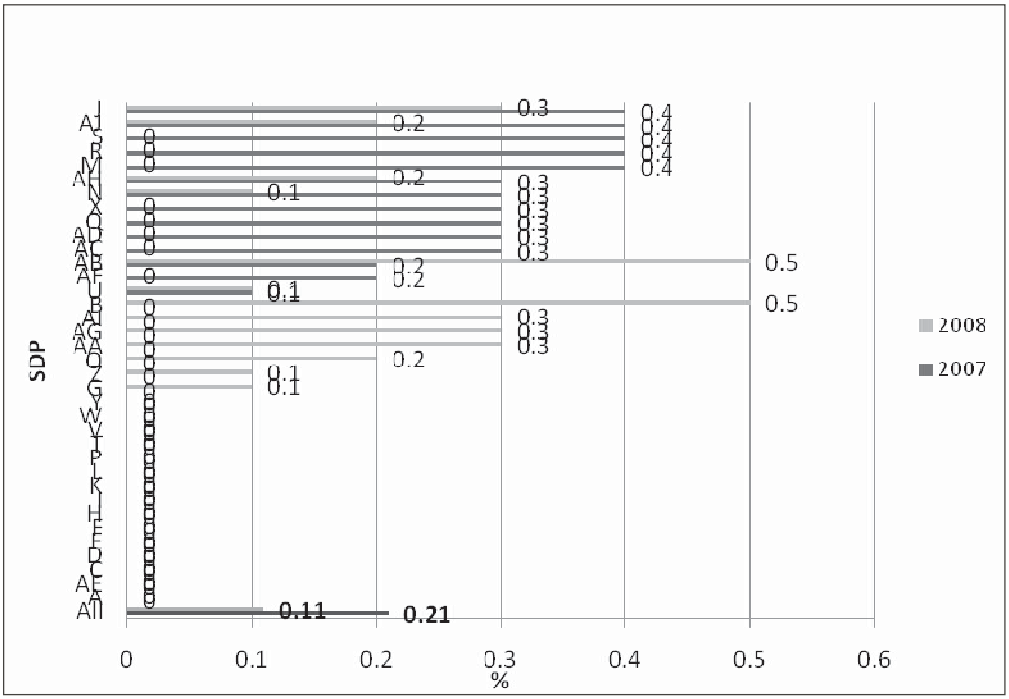


Figure 1.5.1.1(c): Rate of Post-operative Infectious Endophthalmitis, by SDP CSR 2007-2008

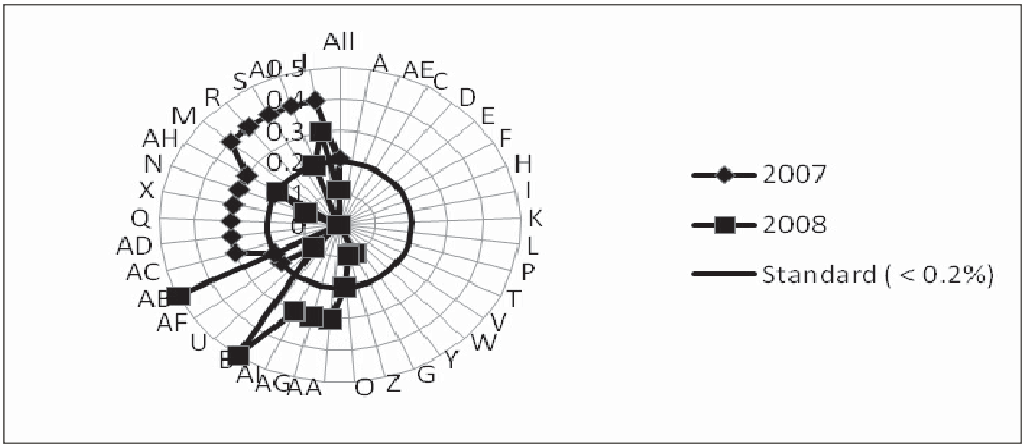


Table 1.5.1.1(b): Time from Surgery to Diagnosis of Post-operative Infectious Endophthalmitis, CSR 2007-2008

Year	2007	2008
Number of patients with post-operative infective endophthalmitis	37	22
Time from surgery to diagnosis of infection (day)	Days	
Min	1	1
Max	92	76
Mean	21.6	20.6
Distribution of patients	Number of Patients	
Less than 3 days	2	5
3-5 days	4	1
6-14 days	8	5
More than 14 days	12	9
Missing	11	2

1.5.1.2 Unplanned return to operating theatre (OT)

Data on unplanned return to OT were available for June to December 2004 and the whole year of 2007 and 2008. The average rate was 0.42% or 4.2 cases per 1000 cataract surgeries.
Among the reasons requiring patients to return to OT; iris prolapse, wound dehiscence and high post-operative IOP showed a decreasing trend. The rate of unplanned return to OT due to problem related to IOL has demonstrated an increase of 4%. The average time for unplanned return to OT was 10 days from surgery.

Table 1.5.1.2(a): Rate for Unplanned Return to OT, CSR 2004-2008

Year	*2004		2007		2008	
Patients with outcome records (N)	9039		17604		20521	
	No	%	No	%	No	%
Patients with unplanned return to OT (%)	31	0.34	87	0.50	88	0.43

* Data in 2004 available only for June-December

Table 1.5.1.2(b): Reasons for Unplanned Return to OT, CSR 2004-2008

Year	*2004		2007		2008	
Reasons	No.	%	No.	%	No.	%
All eyes	31	100	87	100	88	100
Iris prolapse	10	32.3	20	23	12	13.6
Wound dehiscence	7	22.6	13	14.9	7	8
High IOP	4	12.9	5	5.7	2	2.3
IOL related	2	6.5	10	11.5	14	15.9
Infective endophthalmitis	7	22.6	12	13.8	6	6.8
Others	9	29	38	43.7	48	54.5

* Data in 2004 available only for June-December

Figure 1.5.1.2: Reasons for Unplanned Return to OT, CSR 2004-2008

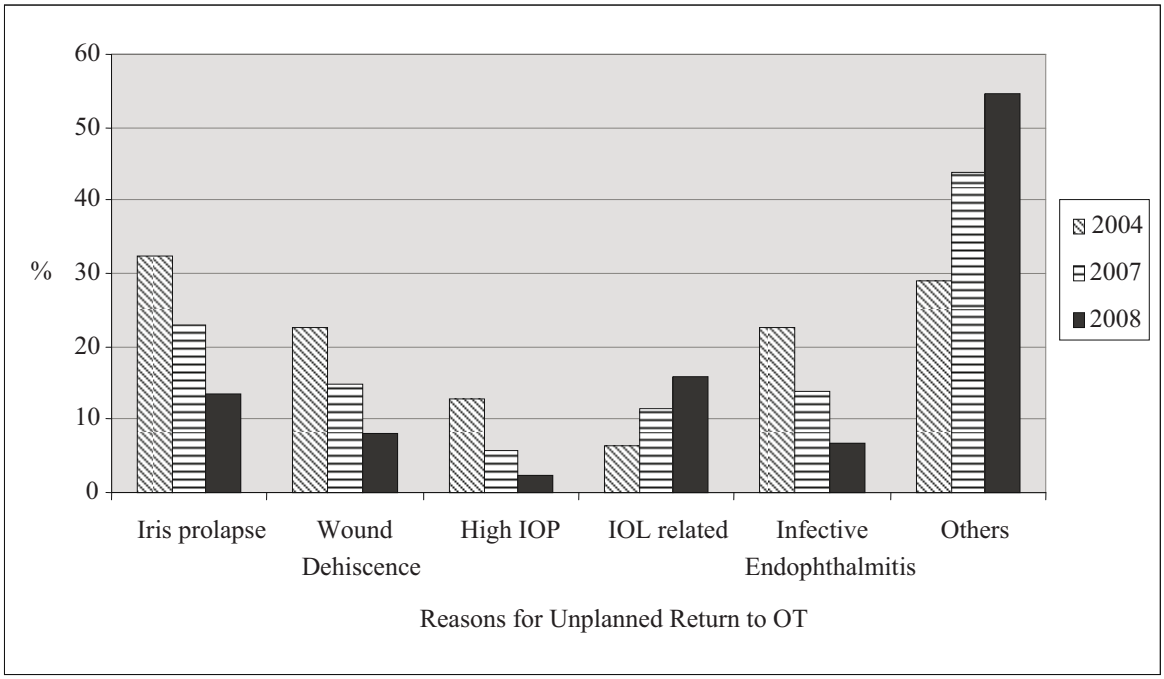


Table 1.5.1.2(c): Time from Surgery to Unplanned Return to OT, CSR 2008

Post-operative period (day)	N	Median	Min	Max	Mean	25th percentile	75th percentile
All cases	88	8	1	58	10	6	11
Iris prolapse	12	7	1	58	12	5	11
Wound dehiscence	6	8	5	10	8	7	9
High IOP	2	9	7	10	9	7	10
IOL related	14	9	1	18	9	6	12
Infective endophthalmitis	6	10	5	13	10	7	12
Others	48	8	1	31	9	6	11

1.5.1.3 Post-operative follow-up period

Most patients were followed up until 8 weeks post-operatively. Patients who had phaco had shortest follow up while those with ICCE had longest follow up.

Table 1.5.1.3(a): Median Follow-up Period for Patients who had only Unaided Vision (in weeks) by Types of Surgery, 2008

Types of surgery	N	Median	25th percentile	75th percentile
All surgeries	19037	8	6	11
Phaco	13349	7	6	10
ECCE	4806	9	6	12
Phaco → ECCE	479	9	6	12
ICCE	109	10	6	12
Lens aspiration	247	8	6	11

Table 1.5.1.3(b): Median Follow-up Period for Patients who had Refracted Vision (in weeks) by Types of Surgery, 2008

Types of surgery	N	Median	25th percentile	75th percentile
All surgeries	17216	8	6	11
Phaco	12043	8	6	10
ECCE	4408	9	7	12
Phaco → ECCE	434	9	6	12
ICCE	91	11	7	13
Lens aspiration	206	9	6	11

1.5.2 Post-operative Visual Acuity

1.5.2.1 Post-operative visual acuity for all patients

Post-operative visual acuity for all patients with and without ocular co-morbidity

- With unaided vision, less than 40% of patients had VA 6/12 or better, about 50% had VA between 6/18-3/60 i.e. low vision category (Table 1.5.2.1).
- With refraction, up to 80% of patients had VA 6/12 or better.

Table 1.5.2.1: Post-operative Visual Acuity for All Patients, CSR 2002-2008

Year	2002				2003				2004				2007				2008			
	Unaided		Refracted		Unaided		Refracted		Unaided		Refracted		Unaided		Refracted		Unaided		Refracted	
VA	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
6/5	9	0.1	60	0.6	16	0.1	91	0.7	2	0.0	17	0.3	3	0	35	0.2	9	0	51	0.3
6/6	598	4.8	2784	26.8	648	4.1	3795	27.8	318	4.7	1659	28.6	878	5.6	4409	30.5	1126	5.9	6072	35.2
6/9	1968	15.7	3773	36.3	2286	14.5	4857	35.6	1011	15.0	2170	37.4	2806	17.8	4961	34.3	3040	15.9	5714	33.1
6/12	2294	18.3	1759	16.9	2858	18.2	2303	16.9	1230	18.3	920	15.8	2717	17.2	2100	14.6	3351	17.6	2577	14.9
6/5-6/12	4869	38.9	8376	80.7	5808	36.9	11046	81.0	2561	38.0	4766	82.1	6404	40.6	11505	79.6	7526	39.4	14414	83.5
6/18	2308	18.5	735	7.1	3046	19.4	970	7.1	1244	18.5	414	7.1	2893	18.3	1055	7.3	3792	19.9	1012	5.9
6/24	1954	15.6	410	4.0	2484	15.8	540	4.0	1130	16.8	205	3.5	2315	14.7	573	4	2978	15.6	607	3.5
6/36	1452	11.6	279	2.7	1935	12.3	359	2.6	761	11.3	169	2.9	1687	10.7	444	3.1	2018	10.6	421	2.4
6/60	868	6.9	166	1.6	1097	7.0	240	1.8	489	7.3	77	1.3	1126	7.1	266	1.9	1300	6.8	261	1.5
5/60	77	0.6	13	0.1	124	0.8	15	0.1	56	0.8	7	0.1	92	0.6	23	0.2	116	0.6	37	0.2
4/6-	64	0.5	13	0.1	114	0.7	29	0.2	40	0.6	6	0.1	87	0.6	35	0.2	97	0.5	30	0.2
3/60	127	1.0	43	0.4	173	1.1	56	0.4	73	1.1	27	0.5	207	1.3	80	0.6	266	1.4	112	0.6
6/18-3/60	6850	54.8	1659	16.0	8973	57.0	2209	16.2	3793	56.3	905	15.6	8407	53.3	2476	17.3	10567	55.4	2480	14.3
2/60	128	1.0	59	0.6	154	1.0	43	0.3	50	0.7	26	0.5	158	1	73	0.5	186	1	70	0.4
1/60	146	1.2	54	0.5	116	0.7	45	0.3	76	1.1	23	0.4	155	1	76	0.5	159	0.8	60	0.3
CF	231	1.9	86	0.8	345	2.2	134	1.0	132	2.0	35	0.6	300	1.9	121	0.8	295	1.5	85	0.5
HM	203	1.6	105	1.0	219	1.4	115	0.8	87	1.3	40	0.7	253	1.6	149	1	230	1.2	84	0.5
PL	54	0.4	27	0.3	77	0.5	33	0.2	25	0.4	6	0.1	75	0.5	46	0.3	53	0.3	22	0.1
NPL	31	0.3	19	0.2	49	0.3	20	0.2	15	0.2	6	0.1	34	0.2	0	0	32	0.2	0	0
	793	6.3	350	3.4	960	6.1	390	2.9	385	5.7	136	2.3	975	6.2	465	3.1	955	5	321	1.8
TOTAL	**12512**		**10385**		**15741**		**13645**		**6739**		**5807**		**15786**		**14446**		**19048**		**17215**	

Figure 1.5.2.1 (a) Percent Distribution of Post-operative Unaided and Refracted Vision

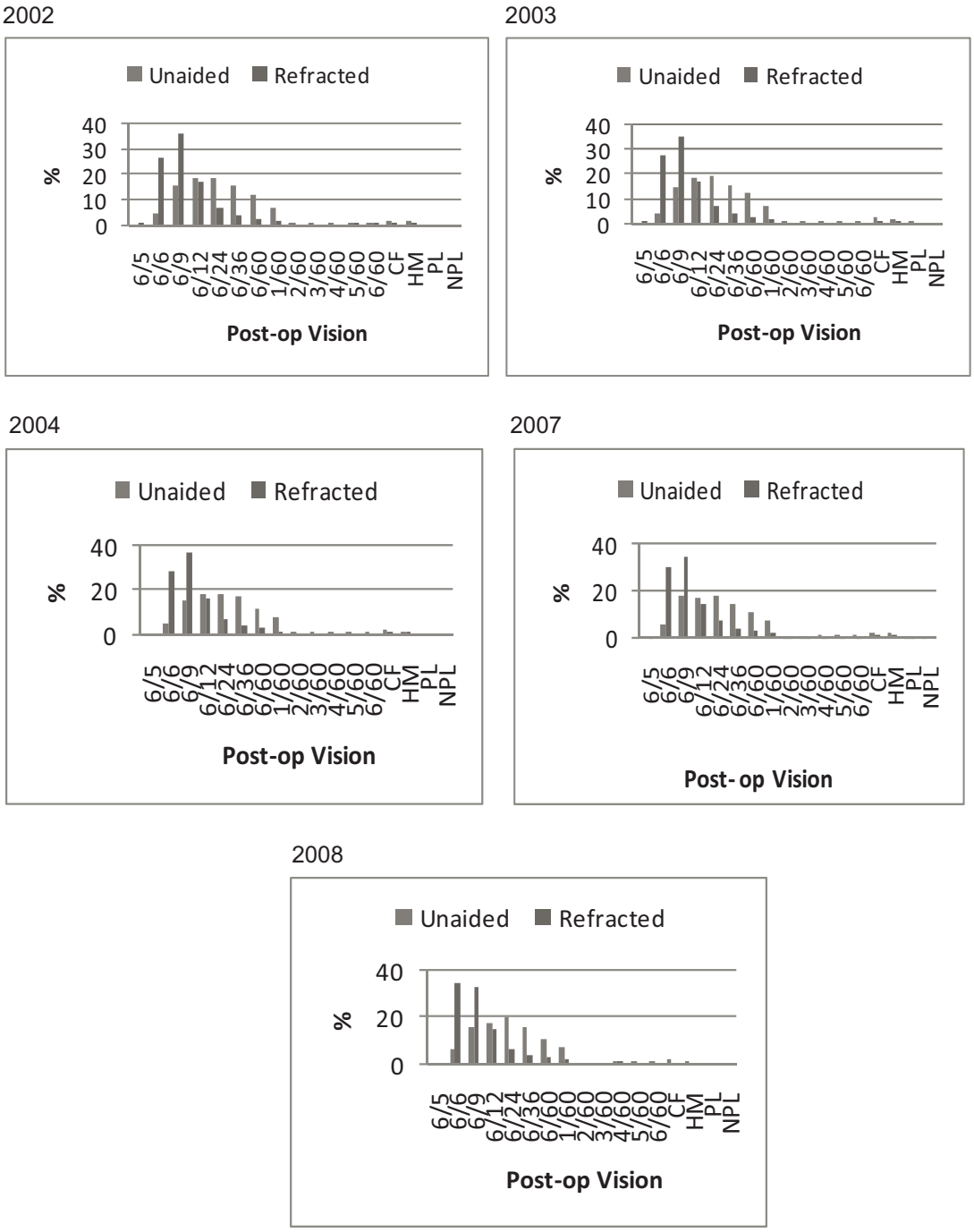
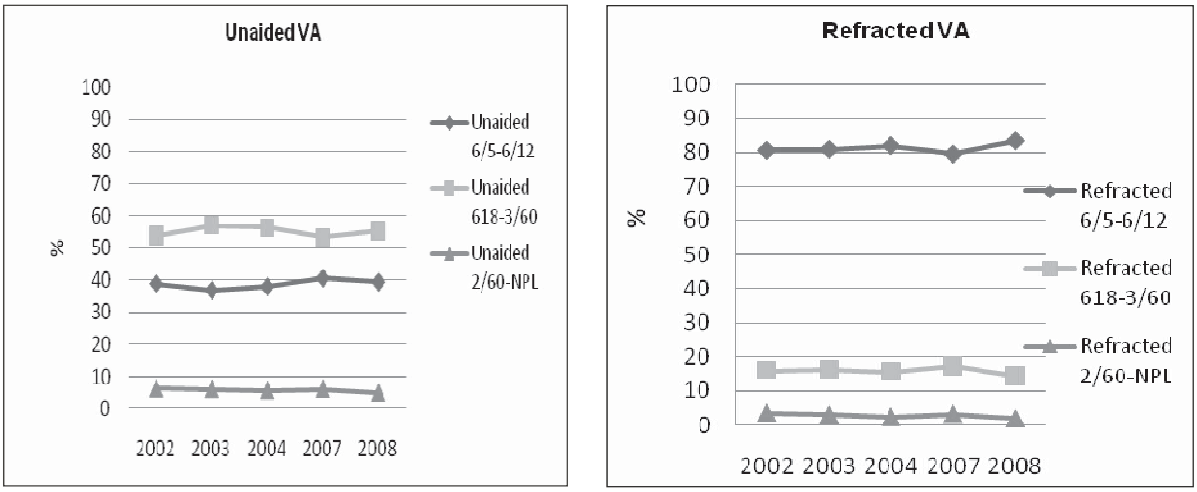


Figure 1.5.2.1(b): Post-operative Visual Acuity by Visual Category for All Patients, CSR 2002-2008



1.5.2.2 Post-operative visual acuity for patients without ocular co-morbidity

When patients with ocular co-morbidity were excluded;

- The percentage of patients with unaided VA 6/12 or better remained around 40%.
- The percentage of patients VA 6/12 or better increased to 88% with refraction (Table 1.5.2.2).

These findings might indicate that the unsatisfactory visual outcome were due to refractive error such as inaccurate IOL power related to biometry or surgically induced astigmatism, rather than pre-existing ocular co-morbidity.

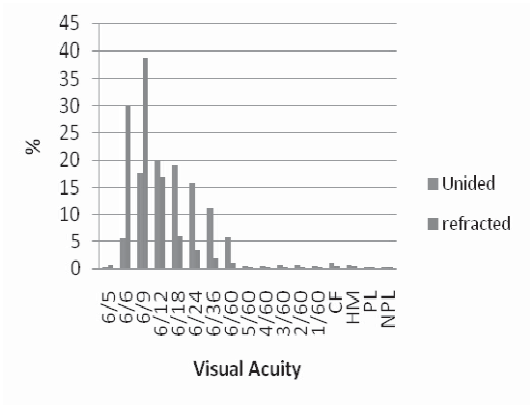
The bimodal pattern of pre-op vision was not seen in pattern of post-op vision (compare figure 1.2.2.6: with figure 1.5.2)

Table 1.5.2.2: Post-operative Visual Acuity for Patients without Ocular Co-morbidity, CSR 2002-2008

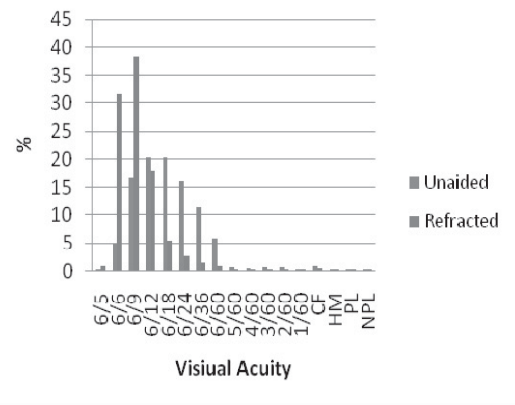
Year	2002				2003				2004				2007				2008			
	Unaided		Refracted		Unaided		Refracted		Unaided		Refracted		Unaided		Refracted		Unaided		Refracted	
VA	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
6/5	7	0.1	44	0.6	9	0.1	70	0.8	1	0.0	14	0.4	3	0.0	25	0.3	2	0.0	23	0.3
6/6	501	5.6	2,229	29.9	511	5.0	2,826	31.6	247	5.9	1,196	32.1	667	6.2	3326	33.5	561	6.2	3061	36.4
6/9	1,568	17.6	2,892	38.7	1,710	16.8	3,421	38.2	758	18.0	1,505	40.5	2061	19.3	3574	36.0	1477	16.4	2939	35.0
6/12	1,780	20.0	1,260	16.9	2,074	20.4	1,595	17.8	871	20.7	608	16.3	2021	18.9	1473	14.8	1683	18.7	1377	16.4
6/5-6/12	3,856	43.4	6,425	86.1	4,304	42.2	7,912	88.4	1877	44.6	3323	89.3	4752	44.4	8398	84.6	3723	41.3	7400	88.1
6/18	1,698	19.1	444	6.0	2,072	20.3	485	5.4	813	19.3	216	5.8	2037	19.1	634	6.4	1882	20.9	411	4.9
6/24	1,403	15.8	240	3.2	1,634	16.0	242	2.7	709	16.8	90	2.4	1619	15.1	351	3.5	1518	16.9	254	3.0
6/36	1,001	11.3	136	1.8	1,162	11.4	140	1.6	443	10.5	55	1.5	1087	10.2	234	2.4	975	10.8	151	1.8
6/60	514	5.8	74	1.0	593	5.8	74	0.8	240	5.7	12	0.3	650	6.1	113	1.1	536	6.0	71	0.8
5/60	39	0.4	6	0.1	61	0.6	3	0.0	26	0.6	2	0.1	52	0.5	8	0.1	52	0.6	10	0.1
4/60	30	0.3	3	0.0	45	0.4	4	0.0	13	0.3	1	0.0	48	0.4	13	0.1	25	0.3	7	0.1
3/60	64	0.7	18	0.2	71	0.7	14	0.2	20	0.5	5	0.1	94	0.9	26	0.3	79	0.9	29	0.3
6/18-3/60	4,749	53.4	921	12.3	5,638	55.3	962	10.7	2264	53.8	381	10.2	5587	52.3	1379	13.9	5067	56.4	933	11.0
2/60	60	0.7	22	0.3	65	0.6	10	0.1	18	0.4	6	0.2	62	0.6	25	0.3	54	0.6	16	0.2
1/60	43	0.5	18	0.2	28	0.3	8	0.1	14	0.3	1	0.0	68	0.6	23	0.2	33	0.4	8	0.1
CF	94	1.1	30	0.4	95	0.9	36	0.4	22	0.5	4	0.1	120	1.1	47	0.5	73	0.8	23	0.3
HM	64	0.7	30	0.4	37	0.4	14	0.2	11	0.3	5	0.1	69	0.6	42	0.4	31	0.3	12	0.1
PL	13	0.2	10	0.1	13	0.1	8	0.1	5	0.1	1	0.0	23	0.2	13	0.1	7	0.1	4	0.0
NPL	11	0.1	9	0.1	10	0.1	5	0.1	1	0.0	0	0.0	8	0.1	7	0.1	7	0.1	0	0.0
2/60 - NPL	285	3.2	119	1.58	248	2.4	81	0.9	71	1.7	17	0.5	350	3.2	157	1.6	205	2.3	63	0.7
TOTAL	**8890**	**100**	**7465**	**100**	**10190**	**100**	**8955**	**100**	**4212**	**100**	**3721**	**100**	**10689**	**100**	**9934**	**100**	**8995**	**100**	**8396**	**100**

Figure 1.5.2.2(a): Post-operative Visual Acuity for Patients without Ocular Co-morbidity, CSR 2003-2008

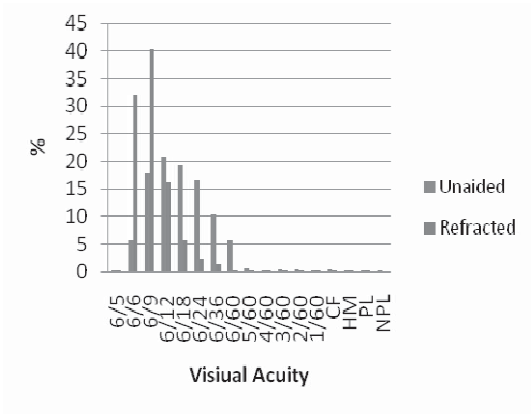
2002



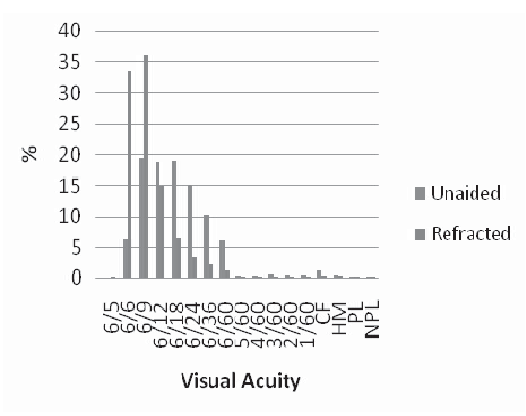
2003



2004



2007



2008

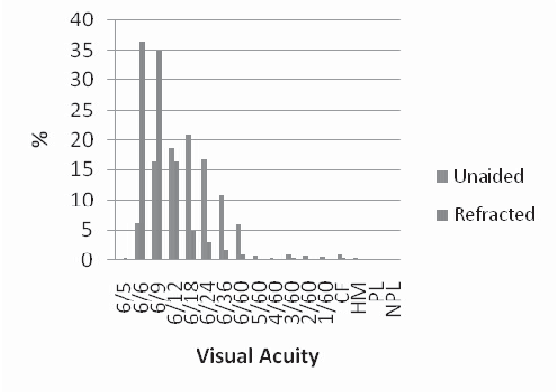
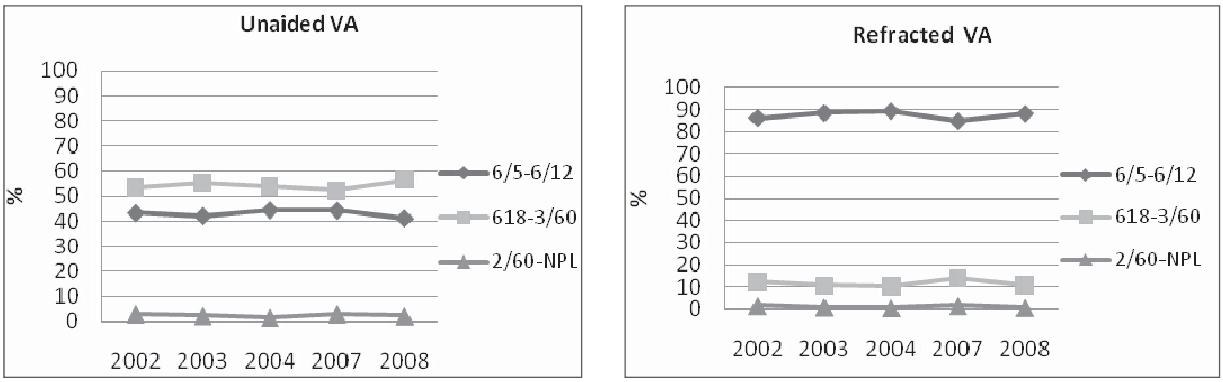


Figure 1.5.2.2(b): Post-operative Visual Acuity by Visual Category for Patients without Ocular Co-morbidity, CSR 2003-2008



1.5.2.3 Post-operative visual acuity 6/12 or better among patients without ocular co-morbidity

Patients who had phacoemulsification had the highest proportion of achieving good visual outcome when compared with other surgeries. The percentage increased from 80.6% in 2002 to 91.3% in 2008. When complication occurred in phacoemulsification which necessitated conversion to ECCE, the visual outcome became less favourable.

The proportion of patients with unaided VA 6/12 or better was less encouraging; with less than 50% in almost all types of surgery throughout the years. These findings indicated that a large number of patients required some forms of visual rehabilitation/correction post-operatively.

Table 1.5.2.3(a): Post-operative Visual Acuity 6/12 or Better for Patients without Ocular Co-morbidities by Types of Surgery, CSR 2002-2008

Year	2002						2003						2004					
	Unaided			Refracted			Unaided			Refracted			Unaided			Refracted		
	N	No	%	N	No	%	N	No	%	N	No	%	N	No	%	N	No	%
All Surgeries	12517	4869	38.9	10392	8376	81	9861	4181	42	8683	7693	89	4058	1818	44.8	3604	3226	90
Phaco	5010	2490	49.7	4311	3746	87	4930	2524	51	4411	4111	93	4138	2226	53.8	1974	1852	94
ECCE	6761	2177	32.2	5490	4255	78	4445	1507	34	3840	3245	85	4823	1659	34.4	1479	1257	85
Phaco ECCE	305	94	30.8	255	192	75	311	88	28	289	236	82	347	107	30.8	91	72	79
Lens Aspiration	315	86	27.3	237	129	54	123	52	42	100	75	75	145	40	27.5	31	23	74
ICCE	80	12	15	66	33	50	8	3	38	6	4	67		7	0	4	2	50
Secondary IOL	33	10	30.3	26	21	81	42	7	17	36	22	61	97	22	22.7	19	15	79

Year	2007						2008					
	Unaided			Refracted			Unaided			Refracted		
	N	No	%	N	No	%	N	No	%	N	No	%
All Surgeries	7130	3080	43	6632	5551	84	8983	3719	41	8390	7392	88
Phaco	4868	2332	48	4508	3890	86	6419	3017	47	5958	5440	91
ECCE	2033	675	33	1910	1520	80	2263	629	28	2158	1744	81
Phaco ECCE	158	36	23	143	89	62	201	40	20	184	140	76
Lens Aspiration	62	33	53	59	46	78	74	29	39	66	54	82
ICCE	15	2	13	10	4	39	24	4	17	19	11	58
Secondary IOL	-	NA	-	-	NA	-	-	NA	-	-	NA	-

Figure 1.5.2.3 (a): Post-operative Visual Acuity 6/12 or Better for Patients without Ocular Co-morbidities by ECCE and Phaco, CSR 2002-2008

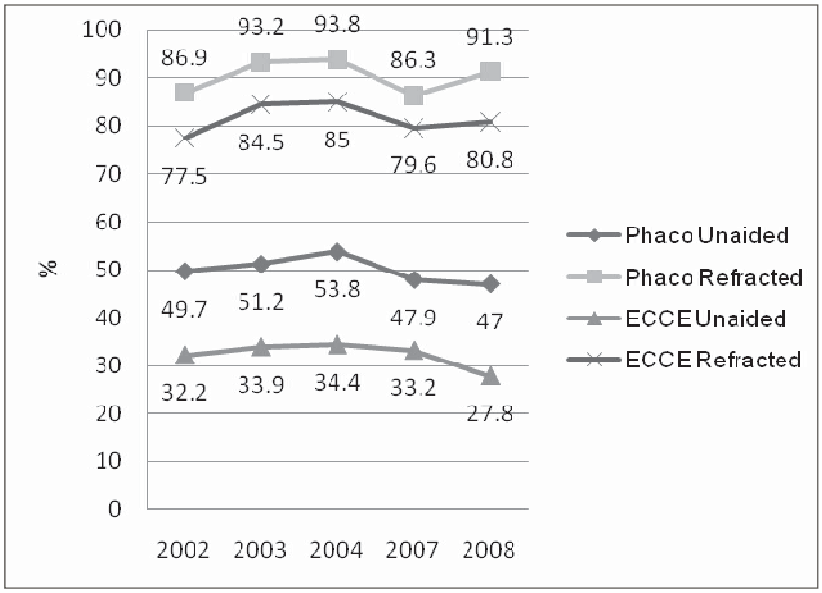


Table 1.5.2.3(b): Post-operative Refracted Visual Acuity 6/12 or Better for Patients without Ocular Co-morbidities by Complications and Types of Surgery, CSR 2008

	Types of Cataract Surgery																	
	All Surgeries			Lens Aspiration			ECCE			Phaco			Phaco □ ECCE			ICCE		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
	8391	7392	88.1	66	54	81.8	2159	1744	80.8	5958	5440	91.3	184	140	76.1	19	11	57.9
With intra-op complications	506	352	69.6	2	2	100	168	110	65.5	253	191	75.5	73	45	61.6	8	3	37.5
No intra-op complications	7885	7040	89.3	64	52	81.3	1991	1634	82.1	5705	5249	92	111	95	85.6	11	8	72.7

In general, for all types of surgery, the visual outcomes were better in eyes with IOL implantation, foldable IOL and IOL made of Acrylic. This trend remained unchanged throughout the years. Better outcome in acrylic IOL could be because of its main use in phaco surgery which was associated with better visual outcome.

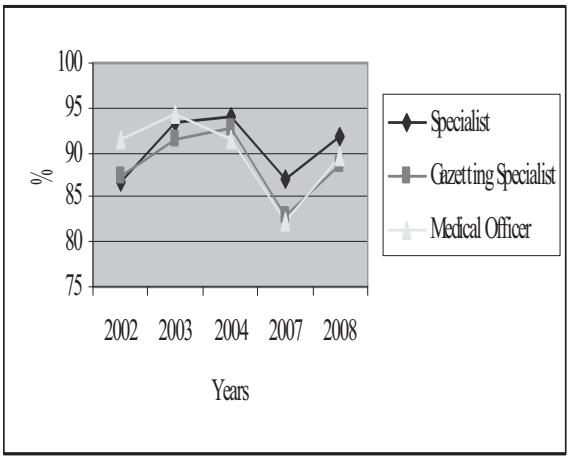
In phacoemulsification, the proportion of patients who could achieve post-operative VA better than 6/12 initially increased among all surgeons. However, it declined in the year 2007 before rising again in 2008. In general, better visual outcomes were observed in phaco and phaco converted to ECCE performed by the specialists. In ECCE, the visual outcomes were comparable between all surgeons and the percentage appeared to be slowly increasing.

Table 1.5.2.3(c): Post-operative Refracted Visual Acuity 6/12 or Better for Patients without Ocular Co-morbidities by Surgeon Status and Types of Surgery, CSR 2008

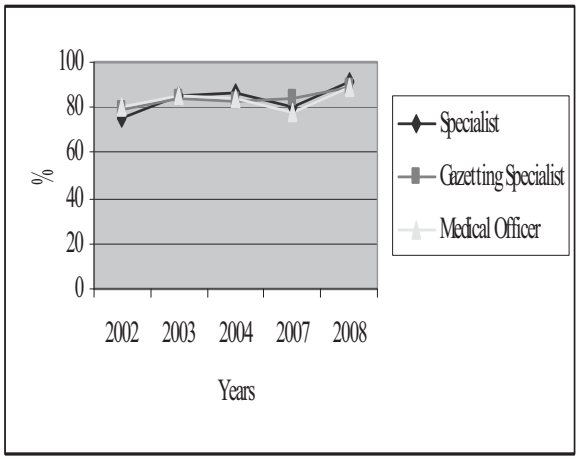
	Types of Cataract Surgery																	
	All Surgeries			Lens Aspiration			ECCE			Phaco			Phaco → ECCE			ICCE		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
N	8356	7360	88.1	66	54	81.8	2149	1735	80.7	5934	5418	91.3	183	139	76.0	19	11	57.9
Surgeon Status																		
Specialist	6567	5872	89.4	57	47	82.5	1368	1131	82.7	4981	4569	91.7	143	114	79.7	14	9	64.3
Gazetting Specialist	700	580	82.9	8	6	75.0	170	120	70.6	494	438	88.7	24	15	62.5	4	1	25.0
Medical Officer	1089	908	83.4	1	1	100	611	484	79.2	459	411	89.5	16	10	62.5	1	1	100

Figure1.5.2.3 (b): Post-operative Refracted Visual Acuity 6/12 or Better for Patients without Ocular Co-morbidities by Surgeon Status and Types of Surgery, CSR 2002-2008

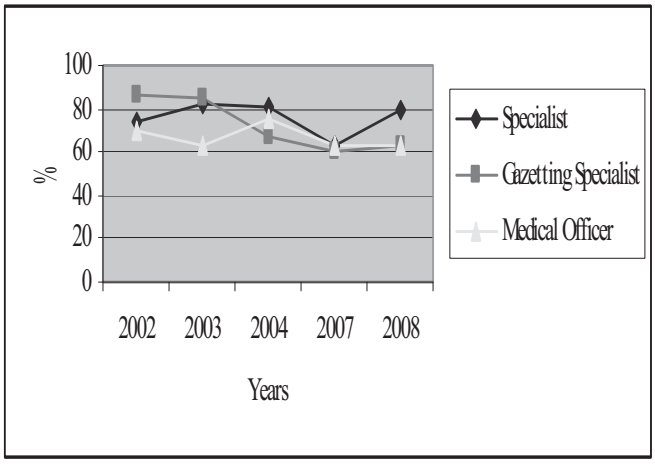
Phaco



ECCE



Phaco→ ECCE



In the year 2008, although analysis for each SDP performing ECCE could not be done due to small numbers; in general, the visual outcomes for all SDPs were below the national standards. For phacoemulsification, one SDP performed less than the national standard (Hospital Q = 76.1%).

Table 1.5.2.3(d): Post-operative Refracted Visual Acuity 6/12 or Better for Patients without Ocular Co-morbidities by SDP and Types of Surgery, CSR 2008

	Type of Cataract Surgery																		
	All Patients	All Surgeries			Lens Aspiration			ECCE			Phaco			Phaco □ECCE			ICCE		
	N	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
All centres	11667	11624	10245	88.1	132	96	72.7	2823	2280	80.8	8356	7644	91.5	267	199	74.5	32	17	53.1
A	590	590	514	87.1	0	0	0	138	111	80.4	440	394	89.5	12	9	75	0	0	0
B	161	161	134	83.2	0	0	0	84	65	77.4	57	52	91.2	20	17	85	0	0	0
C	263	263	234	89	2	1	50	43	29	67.4	208	196	94.2	9	7	77.8	1	1	100
E	312	312	292	93.6	3	2	66.7	195	181	92.8	111	106	95.5	3	3	100	0	0	0
F	25	25	21	84	0	0	0	21	18	85.7	0	0	0	1	1	100	0	0	0
G	877	875	793	90.6	2	0	0	129	110	85.3	735	679	92.4	7	4	57.1	0	0	0
H	293	293	278	94.9	5	5	100	59	56	94.9	226	215	95.1	3	2	66.7	0	0	0
I	41	18	15	83.3	1	0	0	17	15	88.2	0	0	0	0	0	0	0	0	0
J	327	327	282	86.2	12	9	75	129	108	83.7	178	158	88.8	8	7	87.5	0	0	0
K	41	41	38	92.7	0	0	0	21	19	90.5	19	18	94.7	1	1	100	0	0	0
L	26	26	21	80.8	0	0	0	7	4	57.1	17	16	94.1	2	1	50	0	0	0
M	150	150	121	80.7	1	1	100	90	73	81.1	37	28	75.7	22	19	86.4	0	0	0
K	457	457	418	91.5	7	6	85.7	155	134	86.5	275	262	95.3	16	13	81.3	4	3	75
O	1005	998	835	83.7	5	3	60	155	108	69.7	820	715	87.2	12	7	58.3	3	0	0
P	266	266	254	95.5	3	3	100	48	46	95.8	214	204	95.3	1	1	100	0	0	0
Q	219	219	155	70.8	2	1	50	55	33	60	155	118	76.1	4	1	25	1	1	100
R	672	672	632	94	8	8	100	49	37	75.5	601	578	96.2	14	9	64.3	0	0	0
S	109	109	105	96.3	2	2	100	11	10	90.9	94	92	97.9	2	1	50	0	0	0
T	182	182	165	90.7	3	3	100	30	25	83.3	146	135	92.5	2	2	100	0	0	0
U	654	651	576	88.5	5	1	20	35	20	57.1	592	543	91.7	16	10	62.5	2	1	50
V	323	323	298	92.3	9	7	77.8	25	20	80	283	267	94.3	6	4	66.7	0	0	0
W	179	179	137	76.5	2	1	50	176	135	76.7	0	0	0	0	0	0	1	1	100
X	273	273	237	86.8	1	1	100	187	155	82.9	81	78	96.3	3	3	100	1	0	0
Y	101	101	100	99	0	0	0	22	22	100	79	78	98.7	0	0	0	0	0	0
Z	779	779	667	85.6	4	2	50	15	11	73.3	750	651	86.8	9	3	33.3	1	0	0
AA	227	226	207	91.6	3	2	66.7	18	14	77.8	195	182	93.3	9	8	88.9	1	1	100
AB	380	380	328	86.3	14	8	57.1	61	39	63.9	290	272	93.8	11	7	63.6	4	2	50

AC	198	198	193	97.5	2	2	100	83	81	97.6	111	108	97.3	2	2	100	0	0	0
AD	100	100	80	80	0	0	0	97	78	80.4	2	1	50	1	1	100	0	0	0
AE	410	410	358	87.3	7	5	71.4	134	101	75.4	256	241	94.1	13	11	84.6	0	0	0
AF	295	295	246	83.4	3	2	66.7	69	44	63.8	211	190	90	9	7	77.8	2	2	100
AH	705	705	625	88.7	14	12	85.7	233	195	83.7	439	407	92.7	13	9	69.2	6	2	33.3
AI	436	432	401	92.8	3	3	100	97	91	93.8	306	285	93.1	22	19	86.4	3	3	100
AJ	586	586	480	81.9	9	5	55.6	147	104	70.7	415	362	87.2	13	9	69.2	2	0	0

*D, F, L, T, AD and AG were excluded due to <50% ascertainment rate in CSR and/or <50% ascertainment rate in outcome with refracted vision.

Figure 1.5.2.3(c) Post-operative Refracted Visual Acuity 6/12 or Better for Patients without Ocular Co-morbidities by SDP and All Surgeries, CSR 2008 (national KPI->85%)

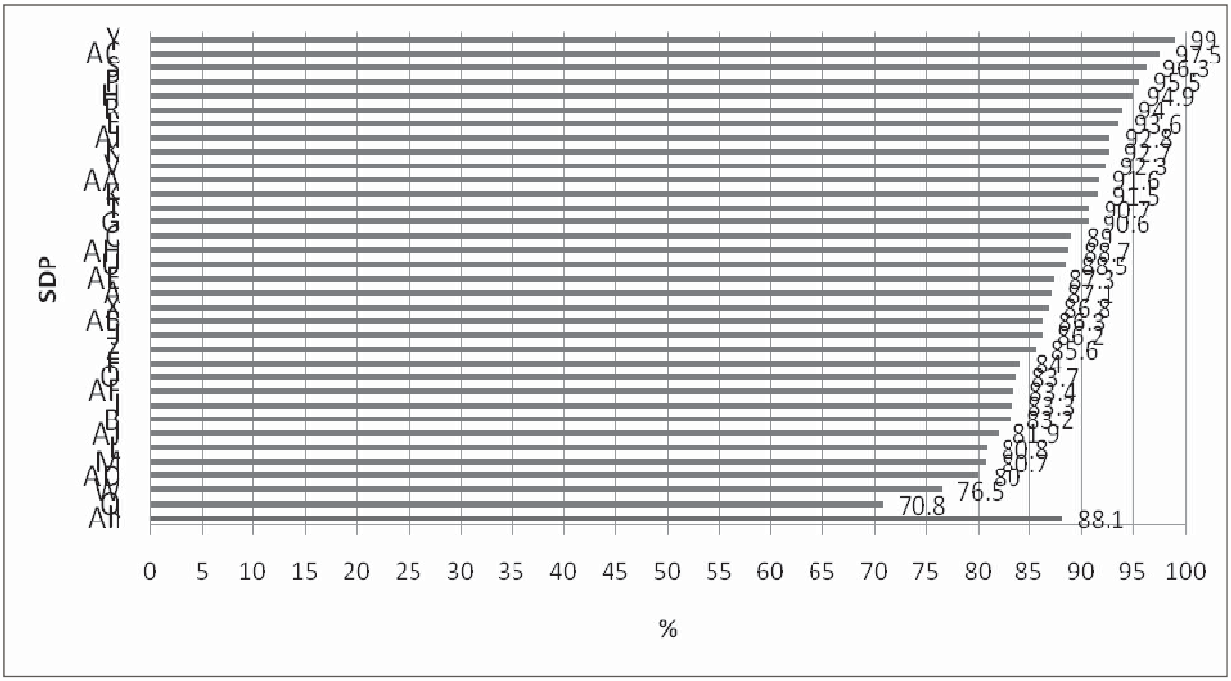


Figure1.5.2.3 (d) Post- op Refracted Visual Acuity 6/12 or Better for Patients without Ocular Co-morbidities by SDP for Phacoemulsification, CSR 2008

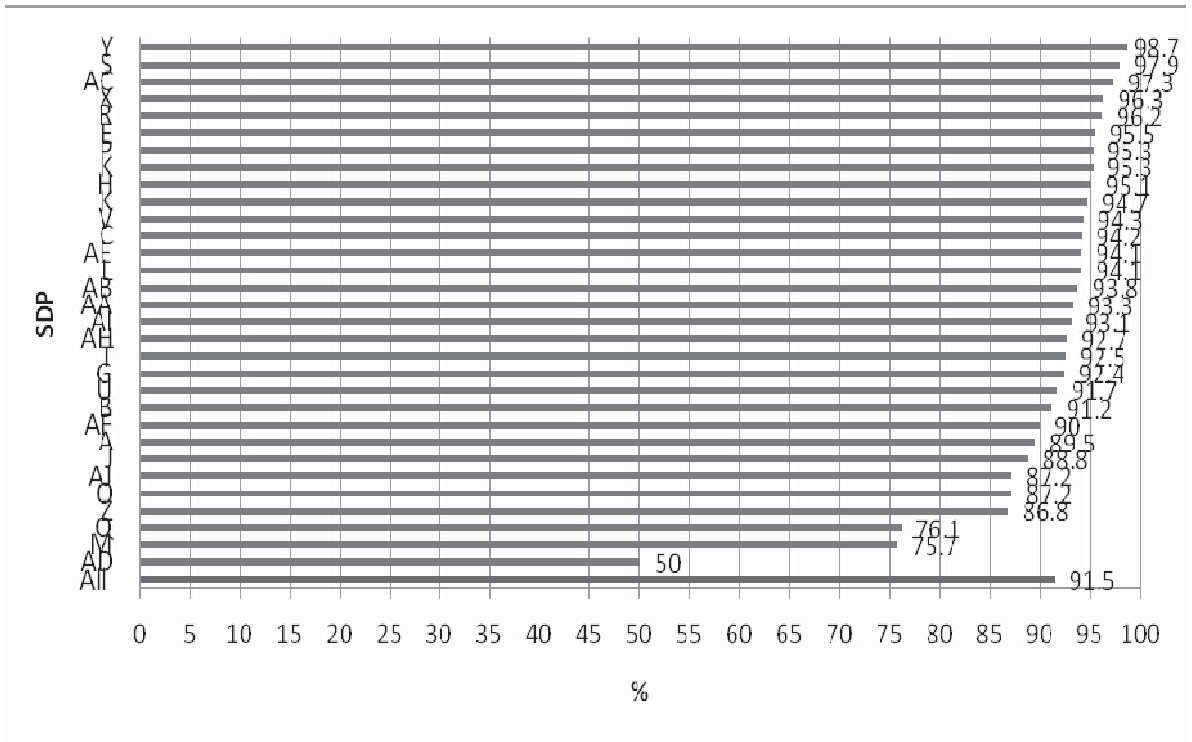
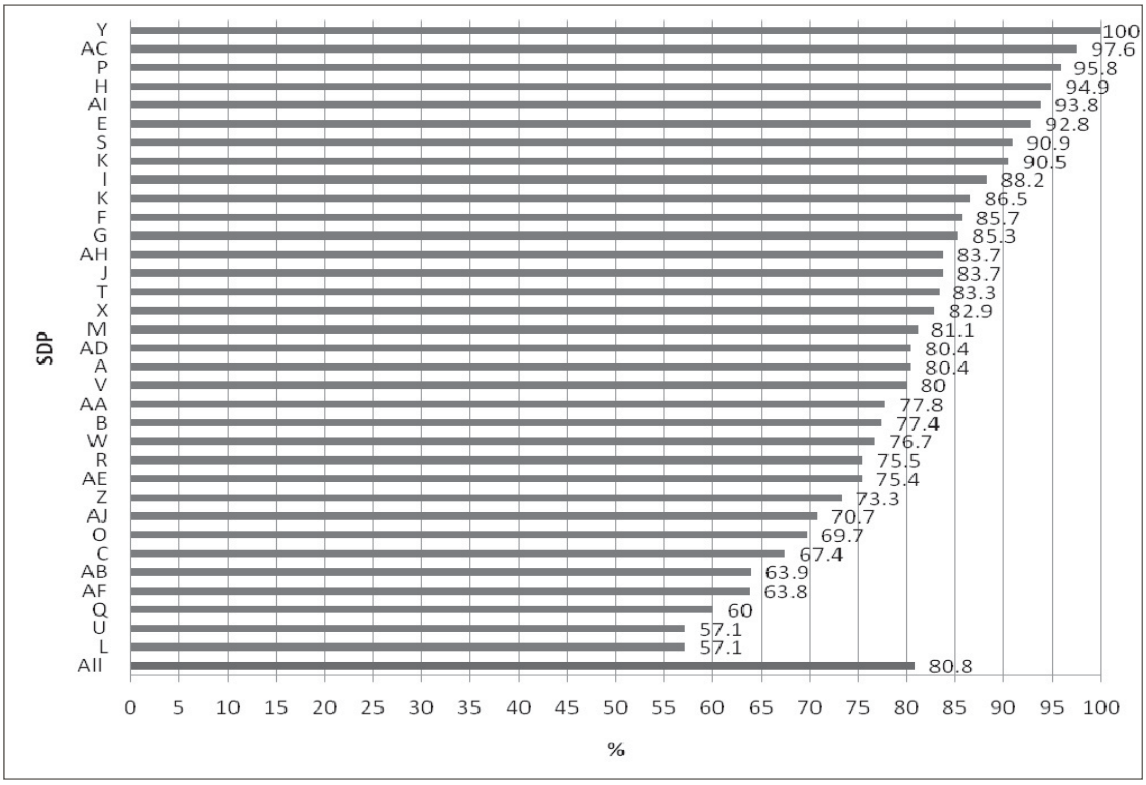


Figure1.5.2.3 (d) Post-op Refracted Visual Acuity 6/12 or Better for Patients without Ocular Co-morbidities by SDP for ECCE, CSR 2008



1.5.3 Reasons for no records of visual acuity

The main reason for no records of VA was loss to follow-up.

Table 1.5.3 Reasons for No Records of Visual Acuity, CSR 2002-2008

Years	2002		2003		2004		2007		2008	
Reasons	No	%	No	%	No	%	No	%	No	%
All cases	1940	100	1331	100	1872	100	1458	100	1463	100
Loss to follow-up	1331	68.1	876	65.8	1177	62.9	1078	73.9	1230	84.1
Discharged by doctor	396	20.4	212	15.9	306	1.6	32	2.2	13	0.9
Unable to take vision	69	3.6	33	40.3	108	5.8	49	3.4	26	1.8
Others	144	7.4	210	15.8	281	15.0	299	20.5	194	13.3

1.5.4 Factors contributing to post-operative refracted visual acuity of worse than 6/12

The main contributing factor for post-operative refracted VA worse than 6/12 was pre-existing ocular co-morbidity, followed by high astigmatism and PCO. This trend was the same throughout the years except in the year 2003 when the percentage for high astigmatism was slightly higher. Cystoid macular edema (CMO), corneal decompensation and retinal detachment as the contributing factors remained low over the years. Overall, the trend was decreasing.

When patients with pre-existing ocular co-morbidity were excluded from analysis from the year 2004 onwards, high astigmatism contributed the highest number followed by pre-existing ocular co-morbidity (not detected preoperatively).

Table 1.5.4(a) Factors Contributing to Post-operative Refracted VA of Worse than 6/12 in All Patients, CSR 2002-2008

Years	2002		2003		2004		2007		2008	
Factors	No	%	No	%	No	%	No	%	No	%
Pre-existing ocular co-morbidity	818	40.7	386	39.1	503	47.2	904	28.8	802	28.4
High astigmatism	489	24.3	392	39.8	321	31.1	478	15.2	460	16.3
Posterior capsular opacity	198	9.9	152	15.4	53	5.0	140	4.5	112	4
Cystoid macular oedema	93	4.6	59	6.0	33	3.1	101	3.2	64	2.3
Endophthalmitis	16	0.8	10	1.0	6	0.6	14	0.4	6	0.2
Corneal decompensation	37	1.8	19	1.9	6	0.6	28	0.9	31	1.1
Decentered IOL	14	0.7	1	0.1	3	0.3	4	0.1	6	0.2
Retinal detachment	27	1.3	8	0.8	7	0.7	67	2.1	50	1.8
Others	302	15.0	202	20.5	134	12.6	620	19.8	603	21.3
Missing/Unavailable	14	0.7	49	5.0	0	0.0	-	-	NA	NA

Figure 1.5.4(a) Factors Contributing to Post-operative Refracted VA of Worse than 6/12 in All Patients, CSR 2002-2008

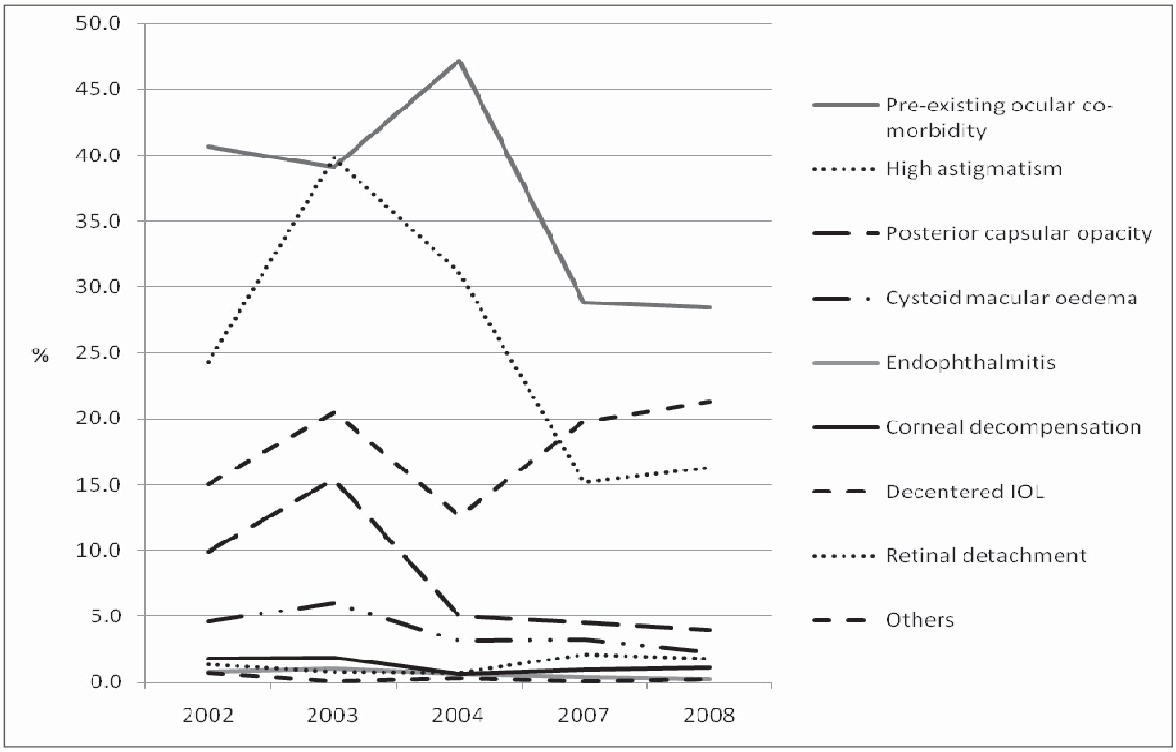


Table 1.5.4(b) Factors Contributing to Post-operative Refracted VA of Worse than 6/12 Among Patients without Pre-existing Ocular co-morbidity, CSR 2004-2008

Years	2004		2007		2008	
Factors	No	%	No	%	No	%
High astigmatism	197	52.0	303	19.7	286	20.6
Pre-existing ocular co-morbidity*	23	6.1	271	17.6	229	16.5
Posterior capsular opacity	20	5.3	83	5.4	61	4.4
Cystoid macular oedema	20	5.3	52	3.4	26	1.9
Endophthalmitis	4	1.0	9	0.6	4	0.3
Corneal decompensation	3	0.8	15	1.0	13	0.9
Decentered IOL	2	0.5	4	0.3	2	0.1
Retinal detachment	1	0.3	18	1.2	11	0.8
Others	76	20.0	320	20.8	323	23.3
Missing/Unavailable	NA	-	461	30.0	NA	-

* not detected before surgery

1.5.5 Actual or residual refractive power

Target refractive power is the refractive power aimed by the surgeon for a patient while the actual/residual refractive power or spherical equivalent (SE) is the postoperative refraction results for the same patient. Myopic shift is the shift of the refraction status (actual refraction) towards more negative value as compared to the targeted refraction pre-operatively. It can be the results of surgery induced astigmatism or more anterior placement of IOL in the bag. It can also be due to indentation of eyeball during biometry resulting in shorter axial length. As a whole, data in 2008 showed slight improvement.

1) Most surgeons targeted refraction to be near emmetropia (mean -0.1, SD 0.4).
2) Slightly less myopic shift for both Phaco and ECCE.

Data for both 2007 and 2008 demonstrated that ECCE produced more myopic shift as compared to phaco.

Table 1.5.5(a) Distribution of Target and Actual Refractive Power in ECCE and Phaco, CSR 2007-2008

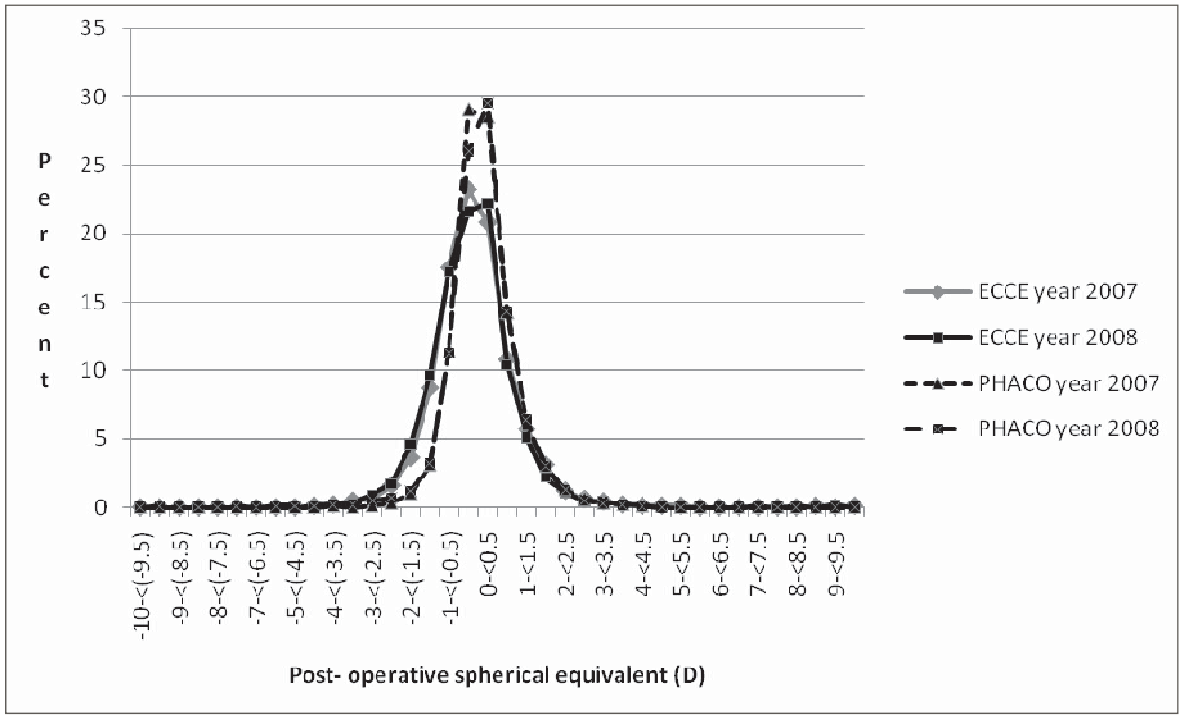
	Target Refraction		Actual Refraction				Actual-Target Refraction	
	All Patient		ECCE		Phaco		All Patient	
Years	2007	2008	2007	2008	2007	2008	2007	2008
N	11876	15083	3624	4400	8343	12085	8738	12295
Mean	-0.5	-0.1	-1.1	-0.2	-0.8	0	-0.5	-0.4
SD	0.4	0.4	1.4	1.2	1.1	1.03	1.1	1.2
Median	-0.5	-0.5	-1	-0.2	-0.7	0	-0.4	-0.4
Minimum	-9	-9.9	-10	-8.4	-10	-10	-9.5	-9.9
Maximum	5	9.5	9.8	10	10	10	5	9

Table 1.5.5(b) Percentage Distribution of Target and Actual Refractive Power in ECCE and Phaco, CSR 2007-2008

	Target Refraction				Actual Refraction							
	All Patients				ECCE				Phaco			
Years	**2007**		**2008**		**2007**		**2008**		**2007**		**2008**	
Dioptre (D)	No	%	No	%	No	%	No	%	No	%	No	%
-10-<(-9.5)	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	1	0.0
-9.5-<(-9)	4	0.0	1	0.0	0	0.0	1	0.0	0	0.0	7	0.1
-9-<(-8.5)	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	1	0.0
-8.5-<(-8)	1	0.0	1	0.0	0	0.0	0	0.0	0	0.0	2	0.0
-8-<(-7.5)	2	0.0	3	0.0	0	0.0	0	0.0	0	0.0	3	0.0
-7.5-<(-7)	1	0.0	0	0.0	0	0.0	1	0.0	1	0.0	11	0.1
-7-<(-6.5)	3	0.0	1	0.0	0	0.0	1	0.0	0	0.0	6	0.0
-6.5-<(-5)	1	0.0	2	0.0	0	0.0	3	0.1	1	0.0	16	0.1
-5-<(-4.5)	3	0.0	4	0.0	1	0.0	1	0.0	1	0.0	15	0.1
-4.5-<(-4)	2	0.0	3	0.0	3	0.1	5	0.1	3	0.0	15	0.1
-4-<(-3.5)	7	0.1	8	0.1	8	0.2	7	0.2	5	0.1	19	0.2
-3.5-<(-3)	6	0.0	7	0.0	19	0.5	15	0.3	2	0.0	29	0.2
-3-<(-2.5)	13	0.1	22	0.1	26	0.6	41	0.9	7	0.1	58	0.5
-2.5-<(-2)	29	0.2	21	0.1	65	1.6	76	1.7	27	0.3	80	0.7
-2-<(-1.5)	77	0.6	48	0.3	149	3.6	203	4.6	88	1.0	147	1.2
-1.5-<(-1)	429	3.5	373	2.5	360	8.7	431	9.7	277	3.1	393	3.2
-1-<(-0.5)	4670	37.7	6155	40.9	722	17.5	763	17.2	1022	11.4	1370	11.3
-0.5-<0	6631	53.5	7481	49.7	956	23.2	956	21.6	2602	29.1	3152	26.0
0-<0.5	406	3.3	719	4.8	860	20.8	983	22.2	2551	28.5	3568	29.5
0.5-<1	77	0.6	145	1.0	444	10.8	460	10.4	1273	14.2	1738	14.3
1-<1.5	12	0.1	28	0.2	236	5.7	228	5.1	546	6.1	780	6.4
1.5-<2	5	0.0	14	0.1	129	3.1	98	2.2	268	3.0	367	3.0
2-<2.5	15	0.1	10	0.1	50	1.2	48	1.1	117	1.3	160	1.3
2.5-<3	0	0.0	6	0.0	24	0.6	22	0.5	59	0.7	56	0.5
3-<3.5	1	0.0	2	0.0	15	0.4	16	0.4	28	0.3	32	0.3
3.5-<4	1	0.0	2	0.0	10	0.2	8	0.2	17	0.2	23	0.2
4-<4.5	0	0.0	0	0.0	3	0.1	3	0.1	12	0.1	12	0.1
4.5-<5	1	0.0	1	0.0	3	0.1	2	0.0	11	0.1	4	0.0
5-<5.5	0	0.0	0	0.0	3	0.1	2	0.0	3	0.0	1	0.0
5.5-<6	0	0.0	0	0.0	2	0.0	1	0.0	1	0.0	3	0.0
6-<6.5	0	0.0	0	0.0	1	0.0	0	0.0	4	0.0	2	0.0
6.5-<7	0	0.0	0	0.0	2	0.0	1	0.0	4	0.0	1	0.0
7-<7.5	0	0.0	0	0.0	1	0.0	3	0.1	0	0.0	1	0.0
7.5-<8	0	0.0	0	0.0	2	0.0	1	0.0	2	0.0	3	0.0
8-<8.5	0	0.0	0	0.0	1	0.0	3	0.1	3	0.0	1	0.0
8.5-<9	0	0.0	0	0.0	5	0.1	1	0.0	0	0.0	0	0.0
9-<9.5	0	0.0	0	0.0	1	0.0	8	0.2	0	0.0	0	0.0
9.5-<10	0	0.0	1	0.0	5	0.1	2	0.0	4	0.0	6	0.0

Eyes with actual refractive power (SE) of more than +10.0D and -10.0D were excluded from analysis

Figure 1.5.5(a) Percentage Distribution of Actual Refractive Power in ECCE and Phaco, CSR 2007-2008

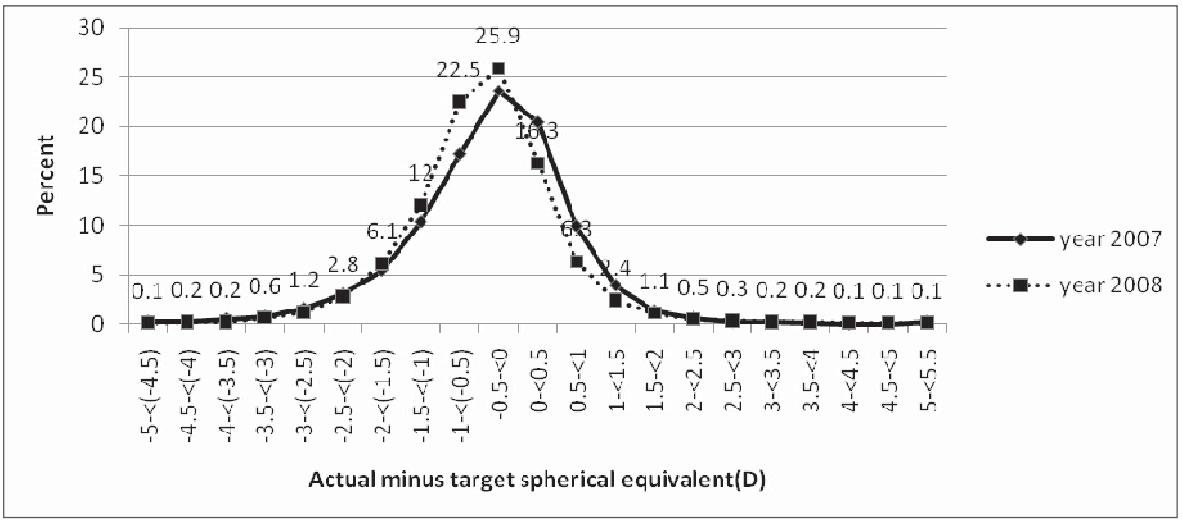


The difference between target and actual refractive power was analysed to assess the disparity between the post-operative refraction and the planned refraction i.e. how far the achieved refraction had deviated from the target. Data in both years demonstrated poor outcome; there was a large disparity between the targeted and the actual refraction. Only ¼ of the patients could achieve what was targetted pre-operatively.

Table 1.5.5(c) Difference in Target and Actual Refractive Power for Patients who had Phacoemulsification Only, CSR 2007-2008

	Target Refraction				Actual Refraction				Difference between actual and target refraction (Actual-Target)			
Years	**2007**		**2008**		**2007**		**2008**		**2007**		**2008**	
Power (D)	No	%	No	%	No	%	No	%	No	%	No	%
N	7975	100	10660	100	8342	100	12154	100	5782	100	8803	100.0
-5-<(-4.5)	2	0.0	4	0.0	15	0.2	13	0.1	12	0.2	12	0.1
-4.5-<(-4)	1	0.0	3	0.0	30	0.4	19	0.2	14	0.2	19	0.2
-4-<(-3.5)	5	0.1	7	0.1	49	0.6	17	0.1	28	0.5	18	0.2
-3.5-<(-3)	5	0.1	6	0.1	97	1.2	20	0.2	43	0.7	51	0.6
-3-<(-2.5)	10	0.1	20	0.2	200	2.4	55	0.5	93	1.6	103	1.2
-2.5-<(-2)	18	0.2	16	0.2	405	4.9	85	0.7	176	3.0	245	2.8
-2-<(-1.5)	51	0.6	35	0.3	746	8.9	164	1.3	311	5.4	541	6.1
-1.5-<(-1)	239	3.0	288	2.7	1382	16.6	423	3.5	595	10.3	1052	12.0
-1-<(-0.5)	2473	31.0	4065	38.1	1771	21.2	1408	11.6	994	17.2	1984	22.5
-0.5-<0	4512	56.6	5498	51.6	1884	22.6	3167	26.1	1367	23.6	2278	25.9
0-<0.5	583	7.3	563	5.3	1069	12.8	3534	29.1	1179	20.4	1434	16.3
0.5-<1	45	0.6	107	1.0	399	4.8	1740	14.3	573	9.9	558	6.3
1-<1.5	6	0.1	23	0.2	142	1.7	786	6.5	225	3.9	214	2.4
1.5-<2	2	0.0	7	0.1	55	0.7	365	3.0	73	1.3	97	1.1
2-<2.5	9	0.1	6	0.1	14	0.2	156	1.3	32	0.6	46	0.5
2.5-<3	1	0.0	4	0.0	15	0.2	55	0.5	14	0.2	26	0.3
3-<3.5	1	0.0	0	0.0	13	0.2	30	0.2	13	0.2	15	0.2
3.5-<4	0	0.0	1	0.0	4	0.0	22	0.2	8	0.1	15	0.2
4-<4.5	2	0.0	0	0.0	3	0.0	10	0.1	3	0.0	12	0.1
4.5-<5	0	0.0	1	0.0	4	0.0	4	0.0	3	0.0	12	0.1
5-<5.5	1	0.0	0	0.0	1	0.0	1	0.0	9	0.2	9	0.1

Figure 1.5.5(b) Difference in Target and Actual Refractive Power for Patients who had Phacoemulsification Only, CSR 2007-2008



Chapter 2

Diabetic Eye Registry

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Chapter 2 DIABETIC EYE REGISTRY

2.1 STOCK AND FLOW

2.1.1 Number of cases registered by states

There were 32 SDPs in 2007 and 35 SDPs in 2008. 10,856 diabetic patients who were seen for the first time by eye care providers were registered in 2007 and 12,014 in 2008. When compared to the total number of new diabetic patients seen at MOH Ophthalmology clinics (N=15564 in 2007 and N=19632 in 2008), the ascertainment rate was 69.8% in 2007 and 61.2% in 2008 .

Table 2.1.1 Number of cases of diabetic patients registered to Diabetic Eye Registry (DER)

States in Malaysia	Year 2007 (N=10856)			Year 2008 (N=12014)			Total	
	No. of SDP	No.	%	No. of SDP	No.	%	No.	%
Kedah	3	1075	9.9	3	1068	8.9	2143	9.4
Pulau Pinang	2	394	3.6	2	561	4.7	955	4.2
Perak	4	1344	12.4	4	1646	13.7	2990	13.1
Selangor	5	2519	23.2	5	2357	19.6	4876	21.3
Negeri Sembilan	2	791	7.3	2	599	5	1390	6.1
Melaka	1	84	0.8	1	190	1.6	274	1.2
Johor	4	1668	15.4	4	1442	12	3110	13.6
Kelantan	2	621	5.7	2	563	4.7	1184	5.2
Terengganu	1	291	2.7	1	591	4.9	882	3.9
Pahang	1	640	5.9	2	1131	9.4	1771	7.7
Sabah	2	677	6.2	4	620	5.2	1297	5.6
Sarawak	2	169	1.6	3	668	5.7	837	3.7
Wilayah Persekutuan	2	583	5.4	2	578	4.8	1161	5.1
All	31	10856	100	35	12014	100	22870	100

2.1.2 Number of cases registered by month

The average number of cases registered per month was 905 patients in 2007 and 1001 patients in 2008. Lower ascertainment rates were noted in the month of October for both years.

Table 2.1.2 Number of cases registered by month

Month	Year 2007		Year 2008		Total	
	N=10856		N=12014		N=22870	
	No.	%	No.	%	No.	%
January	1021	9.4	998	8.3	2019	8.8
February	800	7.4	929	7.7	1729	7.6
March	1002	9.2	1125	9.4	2127	9.3
April	1006	9.3	1304	10.9	2310	10.1
May	1073	9.9	865	7.2	1938	8.5
June	849	7.8	930	7.7	1779	7.8
July	1110	10.2	1225	10.2	2335	10.2
August	939	8.6	1276	10.6	2215	9.7
September	861	7.9	949	7.9	1810	7.9
October	672	6.2	666	5.5	1338	5.9
November	918	8.5	912	7.6	1830	8
December	605	5.6	835	7	1440	6.3
All	10856	100%	12014	100%	22870	100%

2.2 CHARACTERISTICS OF PATIENTS

2.2.1 Patient demography

The majority of patients registered were between 30 to 60 years, with a mean age of 57.3 years in 2007 and 2008. The age was similar for those with and without diabetic retinopathy (DR) in both years.

More female diabetic patients were screened in 2007 (54.9%) and 2008 (56.2%).
The proportion of patients screened and registered was similar to the national ethnic distributions, i.e. highest in Malay (2007: 54.0%), (2008: 55%), followed by Chinese (2007: 23.2%), (2008: 23.1%), Indians (2007: 18.4%), (2008: 16.4%) and others (2007: 3.6%), (2008: 4.6%). The proportion of those with DR were 39.7% and 41.3% in 2007 and 2008 respectively among Malays, 38.4% and 36.6% in 2007 and 2008 respectively among Chinese, 36.5% and 32.6% in 2007 and 2008 respectively among Indians, 25.1% and 26.3% in 2007 and 2008 respectively among indigenous group and 23.5% and 35.7% in 2007 and 2008 respectively in others.

	Year 2007						Year 2008					
	All N=10856		Without DR N=5558		With DR N=4145		All N=12014		Without DR N=6471		With DR N=4594	
Age, years												
Mean	57.3		56.9		56.8		57.3		56.6		57.1	
SD	11.4		12.4		9.8		11.5		12.3		9.9	
Median	58		57.9		57.0		57.8		57.5		57.2	
Age group, years	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<30	211	1.9	170	3.2	33	0.8	222	1.8	170	2.6	44	1
30 - <60	6047	55.7	3101	57.8	2583	63.2	6770	56.4	3606	55.7	2837	61.8
>= 60	4541	41.9	2263	42.2	1506	36.8	5022	41.8	2695	41.6	1713	37.3
Gender												
Male	4898	45.1	2490	44.8	1922	46.4	5261	43.8	2799	43.3	2055	44.7
Female	5955	54.9	3070	55.2	2221	53.6	6753	56.2	3672	56.7	2539	55.3
Ethnic												
Malay	5858	54	2879	51.8	2324	56.1	6612	55	3366	52	2730	59.4
Chinese	2523	23.2	1310	23.6	970	23.4	2781	23.1	1542	23.8	1019	22.2
Indian	1996	18.4	1101	19.7	729	17.6	1972	16.4	1166	18	642	14
Orang Asli	1	0	1	0	0	0	6	0	3	0	2	0
Melanau	106	1	71	1.3	20	0.5	27	0.2	23	0.4	2	0
Kadazan / Murut / Bajau	88	0.8	45	0.8	29	0.7	140	1.2	88	1.4	42	0.9
Iban	0	0	0	0	0	0	19	0.2	12	0.2	6	0.1
Bidayuh	0	0	0	0	0	0	128	1.1	85	1.3	32	0.7
Other	200	1.8	115	2.1	47	1.1	224	1.9	127	2	80	1.7
Missing	84	0.8	39	0.7	26	0.6	105	0.9	59	0.9	39	0.8

2.2.2 Source of Referral

Government primary health care clinics and hospitals were the main source of referrals accounting for 91.7% (2007) and 93.2% (2008) of the referrals. On the contrary, only 2.0% were referred from the private health care providers. From the NHMS data, 20.3% diabetics were being treated by private health care providers. The reasons for low proportion of referral by general practitioners need to be evaluated.

Table 2.2.2 Sources of referral for diabetic patients

No	Sources of referral	Year 2007 N=10856		Year 2008 N=12014		Total N=22870	
		No.	%	No.	%	No.	%
1	Government primary health care clinics	6577	60.6	7825	65.1	14402	63
2	Government hospital - MO or physician	3377	31.1	3370	28.1	6747	30
3	General practitioner	133	1.2	113	0.9	246	1.1
4	Private hospital-MO or specialist	82	0.8	71	0.6	153	0.7
5	Optometrist	14	0.1	21	0.2	35	0.2
6	Others	38	0.4	26	0.2	64	0.3

2.3 MEDICAL HISTORY AND PRACTICE PATTERN

2.3.1 Type of Diabetes

Majority of patients screened in ophthalmology clinics in 2007 and 2008 had type II DM. This reflects the pattern of the diabetic prevalence in Malaysia as shown in NHMS findings where prevalence of DM was 2.4% among those 18 to less than 30 years old and 14.9% among those 30 years and older.

2.3.2 Duration of Diabetes

Most of the patients screened (49% in both 2007 and 2008) had diabetes for more than 5 years. As the risk of DR is higher in patients with longer duration of DM, these patients should have their eyes screened at the recommended schedule of at least once a year.

2.3.3 Type of Treatment

In 2007 and 2008, eighty percent of the patients were on oral medication whilst 11% were on insulin. This is because most patients were of Type II DM.

2.3.4 Systemic co-morbidity

Hypertension (63.4%), hypercholesterolemia (18.1%) and ischemic heart disease (10.3%) were the main systemic co-morbidities found among the diabetic patients registered in both 2007 and 2008. Renal impairment was noted in 5.5% of patients. Only 23.4% of diabetics did not have any form of systemic co-morbidity.

2.3.5 Risk Factors

Among patients registered, 9.1% were current smokers in 2007 with an apparent decrease in percentage (5.2%) in 2008.

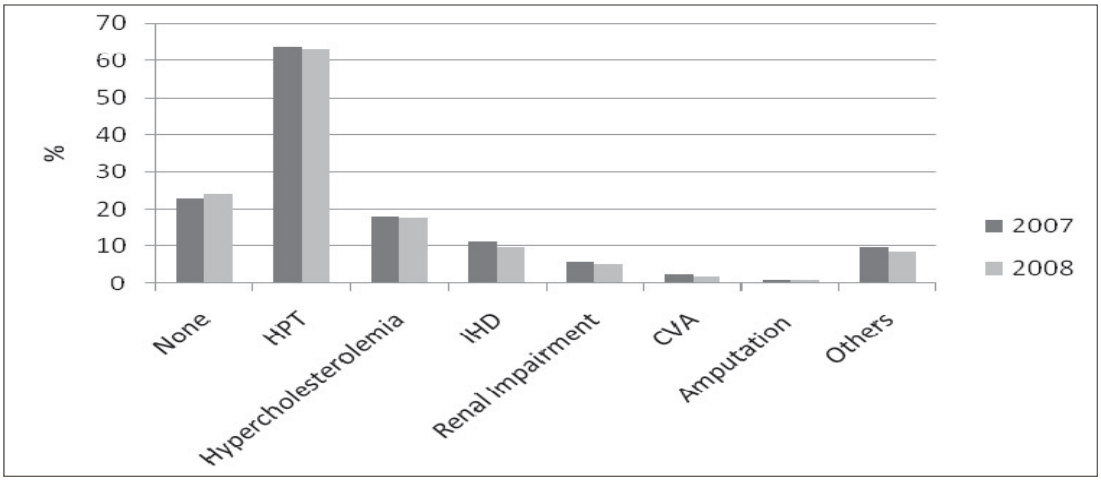
2.3.6 Ocular co-morbidity

Of the 10856 patients registered, 44.2% were found to have cataract and 3.1% had glaucoma in 2007, as compared to 43.4 %(cataract) and 2.5% (glaucoma) out of a total of 12014 patients registered in 2008.

Table 2.3.6 Past medical and ocular history

	Year 2007		Year 2008		Total	
Types of DM	No.	%	No.	%	No.	%
Type II	9995	92.0	10892	90.7	20887	91.3
Type I	571	5.3	636	5.3	1207	5.3
Pre-diabetic	-	-	20	0.2	20	0.1
Missing	290	2.7	466	3.9	756	3.3
Duration of DM, years						
<5	3612	33.3	3740	31.1	7352	32.1
5-10	3355	30.8	3827	31.9	7182	31.4
>10-20	1625	15.0	1736	14.4	3361	14.7
>20	333	3.1	368	3.1	701	3.1
Missing	1931	17.8	2343	19.5	4274	18.7
Types of treatment						
Diet	-	-	494	4.1	494	2.2
Oral medication	8958	82.0	9357	77.9	18315	80
Insulin	1393	11.8	1042	8.7	2435	10.6
Other	727	6.2	636	5.3	1363	6
Systematic Co-morbidity						
None	2463	22.7	2898	24.1	5361	23.4
HPT	6935	63.9	7575	63.1	14510	63.4
Hypercholesterolemia	1981	18.2	2155	17.9	4136	18.1
IHD	1203	11.1	1159	9.6	2362	10.3
Renal Impairment	632	5.8	622	5.2	1254	5.5
CVA	260	2.4	232	1.9	492	2.2
Amputation	70	0.6	73	0.6	143	0.6
Others	1064	9.7	1018	8.5	2082	9.1
Smoking						
smoking	991	9.1	629	5.2	1620	7.1
Ocular co-morbidity						
None	4435	40.9	5429	45.2	9864	43.1
Cataract	4799	44.2	5122	42.6	9921	43.4
Glaucoma	337	3.1	229	1.9	566	2.5
Rubeosis irides	58	0.5	-	-	58	0.3
Others	445	4.1	413	3.4	858	3.8

Figure 2.3.6 Systemic co-morbidities



**multiple checks were allowed for systemic co-morbidity*

2.3.7 Pregnancy and eye examination

Among 5927 female patients, 148 (2.5%) were pregnant at the time of first eye examination in 2007 compared to 208(3.1%) among 6753 female patients in 2008. Most of them were seen at the second trimester (41.2%) in 2007 but in 2008 more were seen in the first trimester (43.8%). This could be due to an increased level of awareness to the need for eye screening among pregnant diabetics.

Table 2.3.7 Female diabetic patients who were pregnant

	2007		2008		Total	
	No. of female=5927		No. of female=6753		No. of female=12680	
Pregnant status	No.	% among female	No.	% among female	No.	% among female
Pregnant	148	2.5% among female	208	3.1% among female	356	2.8% among female
Pregnant in female						
• 1st Trimester	54	36.5	91	43.8	145	40.7
• 2nd Trimester	61	41.2	76	36.5	137	38.5
• 3rd Trimester	26	17.6	38	18.3	64	18
• Missing	7	4.7	3	1.4	10	2.8

2.3.8 Previous eye examinations

More than two-thirds of the patients; (70.9%) in 2007 and (71.5%) in 2008, never had an eye examination. Among those examined, 71.8% (2007) and 68.4% (2008) had their eye examined in the last one year. The proportion of patients who had never had an eye examination was higher than that noted in NHMS 2006, where 55% never had an eye examination and of the 45% who had eye examination, 32.9% had it done in the last 1 year, 49.7% the last 1 to 2 years and 17.4% in more than 2 years.

Table 2.3.8 Distribution of previous eye examination

	2007		2008		Total	
Eye examination	N=10856		N=12014		N=22870	
	No.	%	No.	%	No.	%
Never had eye examination before	7700	70.9	8653	72	16353	71.5
Had eye examination before	1869	17.2	1740	14.5	3609	15.8
• Last 1 year	1342	71.8	1127	64.8	2469	68.4
• Last 1-2 years	77	4.1	95	5.5	172	4.8
• > 2 years	1	0.1	0	0	1	0
• Missing	449	24	518	29.8	967	26.8
Missing	1287	11.8	1621	13.5	2908	12.7

2.4 STATUS OF THE EYES

2.4.1 Status of visual acuity

Generally, about 9% (2007 and 2008) of eyes screened were blind, with unaided and presenting VA of worse than 3/60. Eyes with DR had worse vision when compared with eyes without DR.

Table 2.4.1(a) Distribution of unaided visual acuity by eyes

	Year 2007				Year 2008			
Unaided VA	Right Eye N=10856		Left Eye N=10856		Right eye N=12014		Left eye N=12014	
	No.	%	No.	%	No.	%	No.	%
6/5	4	0	5	0	4	0	9	0.1
6/6	1009	9.3	1072	9.9	1273	10.6	1341	11.2
6/9	1860	17.1	1960	18.1	2118	17.6	2207	18.4
6/12	1333	12.3	1316	12.1	1482	12.3	1502	12.5
6/5 to 6/12	4206	38.7	4353	40.1	4877	40.5	5059	42.2
6/18	1297	11.9	1263	11.6	1491	12.4	1436	12
6/24	1176	10.8	1162	10.7	1230	10.2	1213	10.1
6/36	840	7.7	754	6.9	870	7.2	762	6.3
6/60	612	5.6	566	5.2	596	5	601	5
5/60	61	0.6	72	0.7	61	0.5	81	0.7
4/60	66	0.6	73	0.7	80	0.7	84	0.7
3/60	122	1.1	110	1	132	1.1	138	1.1
6/18 to 3/60	4174	38.4	4000	36.8	4460	37.1	4315	35.9
2/60	144	1.3	142	1.3	133	1.1	120	1
1/60	168	1.5	153	1.4	188	1.6	179	1.5
CF	302	2.8	297	2.7	359	3	335	2.8
HM	257	2.4	273	2.5	268	2.2	225	1.9
PL	76	0.7	82	0.8	69	0.6	82	0.7
NPL	40	0.4	37	0.3	61	0.5	51	0.4
3/60 to NPL	987	9.1	984	9.0	1078	9	992	8.3

Table 2.4.1(b) Distribution of presenting visual acuity by eyes

	Year 2007				Year 2008			
Presenting VA (with or without glasses)	Right Eye N=10856		Left Eye N=10856		Right Eye N=12014		Left Eye N=12014	
	No.	%	No.	%	No.	%	No.	%
6/5	16	0.1	15	0.1	19	0.2	20	0.2
6/6	1636	15.1	1679	15.5	2091	17.4	2114	17.6
6/9	2942	27.1	2856	26.3	3615	30.1	3657	30.4
6/12	1433	13.2	1555	14.3	1708	14.2	1679	14
6/5 to 6/12	6027	55.5	6105	56.2	7433	61.9	7470	62.2
6/18	1207	11.1	1155	10.6	1314	10.9	1277	10.6
6/24	950	8.8	926	8.5	835	7	860	7.2
6/36	633	5.8	565	5.2	548	4.6	541	4.5
6/60	412	3.8	417	3.8	370	3.1	367	3.1
5/60	48	0.4	62	0.6	42	0.3	68	0.6
4/60	57	0.5	62	0.6	66	0.5	69	0.6
3/60	94	0.9	88	0.8	79	0.7	102	0.8
6/18 to 3/60	3401	31.3	3275	30.2	3254	27.1	3284	27.4
2/60	111	1	117	1.1	103	0.9	98	0.8
1/60	144	1.3	136	1.3	166	1.4	148	1.2
CF	292	2.7	302	2.8	357	3	335	2.8
HM	256	2.4	283	2.6	267	2.2	237	2
PL	76	0.7	82	0.8	75	0.6	80	0.7
NPL	45	0.4	38	0.4	79	0.7	58	0.5
3/60 to NPL	924	8.5	958	8.8	1047	8.8	956	8

Table 2.4.1(c) Status of visual acuity among diabetic patients with and without DR

Presenting VA (with or without glasses)	Year 2007								Year 2008							
	Normal eye				With diabetic retinopathy or maculopathy				Normal eye				With diabetic retinopathy or maculopathy			
	Right eye N=6060		Left eye N=6054		Right eye N=3735		Left eye N=3743		Right eye N=6994		Left eye N=7036		Right eye N=4182		Left eye N=4118	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
6/5	15	0.2	11	0.2	1	0	4	0.1	19	0.3	18	0.3	0	0	1	0
6/6	1212	20	1227	20.3	385	10.3	411	11	1526	21.8	1578	22.4	544	13	505	12.3
6/9	1920	31.7	1881	31.1	975	26.2	932	24.9	2384	34.1	2430	34.5	1170	28	1164	28.3
6/12	846	14	933	15.4	551	14.8	583	15.6	1031	14.7	981	13.9	634	15.2	639	15.5
6/5 to 6/12	3993	65.9	4052	67.0	1912	51.2	1930	51.6	4960	70.9	5007	71.1	2348	56.2	2309	56.1
6/18	668	11	664	11	503	13.5	461	12.3	735	10.5	717	10.2	532	12.7	517	12.6
6/24	506	8.3	485	8	416	11.1	402	10.7	417	6	437	6.2	384	9.2	375	9.1
6/36	316	5.2	268	4.4	272	7.3	271	7.2	271	3.9	268	3.8	250	6	246	6
6/60	180	3	191	3.2	191	5.1	190	5.1	158	2.3	162	2.3	163	3.9	157	3.8
5/60	20	0.3	24	0.4	22	0.6	30	0.8	12	0.2	26	0.4	21	0.5	36	0.9
4/60	22	0.4	29	0.5	24	0.6	26	0.7	28	0.4	23	0.3	25	0.6	33	0.8
3/60	36	0.6	33	0.5	45	1.2	44	1.2	29	0.4	30	0.4	33	0.8	45	1.1
6/18 to 3/60	1748	28.8	1694	28.0	1473	39.4	1424	38.0	1650	23.7	1663	23.6	1408	33.7	1409	34.3
2/60	48	0.8	49	0.8	45	1.2	41	1.1	34	0.5	31	0.4	46	1.1	44	1.1
1/60	60	1	48	0.8	42	1.1	49	1.3	54	0.8	64	0.9	68	1.6	56	1.4
CF	74	1.2	65	1.1	113	3	122	3.3	97	1.4	80	1.1	135	3.2	126	3.1
HM	36	0.6	42	0.7	70	1.9	83	2.2	45	0.6	29	0.4	55	1.3	56	1.4
PL	12	0.2	7	0.1	14	0.4	21	0.6	9	0.1	8	0.1	12	0.3	13	0.3
NPL	9	0.1	11	0.2	13	0.3	6	0.2	16	0.2	9	0.1	28	0.7	12	0.3
Worse than 3/60	239	3.9	222	3.7	297	7.9	322	8.7	255	3.6	221	3	344	8.2	307	7.6

2.4.2 Status of diabetic retinopathy and maculopathy

Among the patients screened, 60.4% in 2007 and 50.8% in 2008 had no apparent DR in both their eyes. Up to 38.2% in 2007 and 36.1% in 2008 had some form of DR in either eye and 11.9% in 2007 and 9.6% in 2008 had maculopathy.

Among 21712 eyes examined in 2007, 12114 eyes (55.8%) had no apparent DR, 7478 eyes (34.4%) had some form of DR, and 2031 eyes (9.4%) had maculopathy. Up to 4.1% of eyes could not be examined due to poor view of fundus. In comparison to 24,763 eyes examined in 2008, 14,030 eyes (56.7%) had no apparent DR, 8,300 eyes (33.5%) had some form of DR, and 1,969 eyes (8.0%) had maculopathy. Generally, up to 5.0% of eyes could not be examined due to poor view of fundus.

The level of severity of DR among eyes examined showed that 67.3%(2007); 76.8%(2008) had mild to moderate NPDR, 8.6%(2007); 18.7%(2008) had severe NPDR and 18.1%(2007); 11.4%(2008) had PDR, of which 5.9%(2007); 4.8%(2008) was at advanced diabetic eye disease state.

Among 21712 and 24763 eyes examined in 2007 and 2008 respectively showed 15.6 %(2007) and 11.5 %(2008) had vision threatening DR (PDR and maculopathy).

Table 2.4.2(a) Status of diabetic retinopathy, by individuals

		Year 2007		Year 2008		Total	
No.	Diabetic retinopathy types	N=10856		N=12739		N=23595	
		No.	%	No.	%	No.	%
1	No diabetic retinopathy	6553	60.4	6471	50.8	13024	55.2
2	Diabetic Retinopathy*	4145	38.2	4594	36.1	8739	37
3	Maculopathy**	1287	11.9	1225	9.6	2512	10.6
4	No view of fundus	689	6.3	297	2.3	986	4.2

**Diabetic retinopathy: Patients who have any type of diabetic retinopathy including maculopathy.*
***Maculopathy: patients with maculopathy may also have other types of diabetic retinopathy.*
The percentage add up to be more than 100% as patient with maculopathy may have other types of diabetic retinopathy.

Table 2.4.2(b) Status of diabetic retinopathy, by eyes

Diabetic retinopathy types	Year 2007						Year 2008					
	Right Eye N=10856		Left Eye N=10856		All Eyes N= 21712		Right Eye N=12394		Left Eye N=12369		All Eyes N=24763	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No diabetic retinopathy	6060	55.8	6054	55.8	12114	55.8	6994	56.4	7036	56.9	14030	56.7
Diabetic Retinopathy*	3735	34.4	3743	34.5	7478	34.4	4182	33.7	4118	33.3	8300	33.5
Maculopathy**	1031	9.5	1000	9.2	2031	9.4	1003	8.1	966	7.8	1969	8.0
No view of fundus	474	4.4	427	3.9	901	4.1	623	5.0	611	4.9	1234	5.0
Total	11300	104.1	11224	103.4	22524	103.7	12802	103.2	12731	102.9	25533	103.2

**Diabetic retinopathy is patients who have any type of diabetic retinopathy including maculopathy.*
***Maculopathy is those with maculopathy, with or without other types of diabetic retinopathy.*
The percentages add up to be more than 100% as patient with maculopathy may have other types of diabetic retinopathy.

Table 2.4.2 (c) Level of severity of diabetic retinopathy by eyes

Diabetic Retinopathy types	Year 2007						Year 2008					
	Right Eye N=10856		Left Eye N=10856		All Eyes N=21712		Right Eye N=12394		Left Eye N=12369		All Eyes N=24763	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No diabetic retinopathy	6060	55.8	6054	55.8	12114	55.8	6994	56.4	7036	56.9	14030	56.7
Any diabetic retinopathy	3735	34.4	3743	34.5	7478	34.4	4017	34.8	3950	34.3	7772	34.6
Mild NPDR	1579	42.3	1573	42	3152	42.2	2001	49.8	1937	49.0	3938	50.7
Moderate NPDR	931	24.9	943	25.2	1874	25.1	1031	25.7	998	25.3	2029	26.1
Severe NPDR	336	9	308	8.2	644	8.6	367	9.1	370	9.4	737	18.7
PDR*	672	18	681	18.2	1353	18.1	438	10.9	450	11.4	888	11.4
Maculopathy*	1031	9.5	1000	9.2	2031	9.4	1003	8.1	966	7.8	1969	8
*Note : ADED	228	6.1	216	5.8	444	5.9	180	4.5	195	4.9	375	4.8

**multiple checks were allowed for diabetic retinopathy types*

2.5 TREATMENT PLAN

Majority of patients (83.3%) did not require any intervention and were given follow up appointment in 2007 and 2008. However, 10.2 %(2007) and 8.7 % (2008) of the patients required laser and also 3.1 % (2007) and 0.5% (2008) required vitrectomy at the first visit to ophthalmology clinics. The low vitrectomy percentage could be due to low ascertainment rate or under reporting by SDPs.

Table 2.5 Treatment plans

	Year 2007		Year 2008		Total	
Treatment plans	N=10856		N=12014		N=22870	
	No.	%	No.	%	No.	%
Follow up only	9038	83.3	10013	83.3	19051	83.3
Need laser	1103	10.2	1046	8.7	2149	10
Need vitrectomy	332	3.1	60	0.5	392	1.7
Need further assessment such as FFA	49	0.5	43	0.4	92	0.4
Missing	631	5.8	926	7.7	1557	6.8

Chapter 3

Contact lens-related corneal ulcer surveillance

Contributing Editors

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CHAPTER 3 CONTACT LENS RELATED CORNEAL ULCER

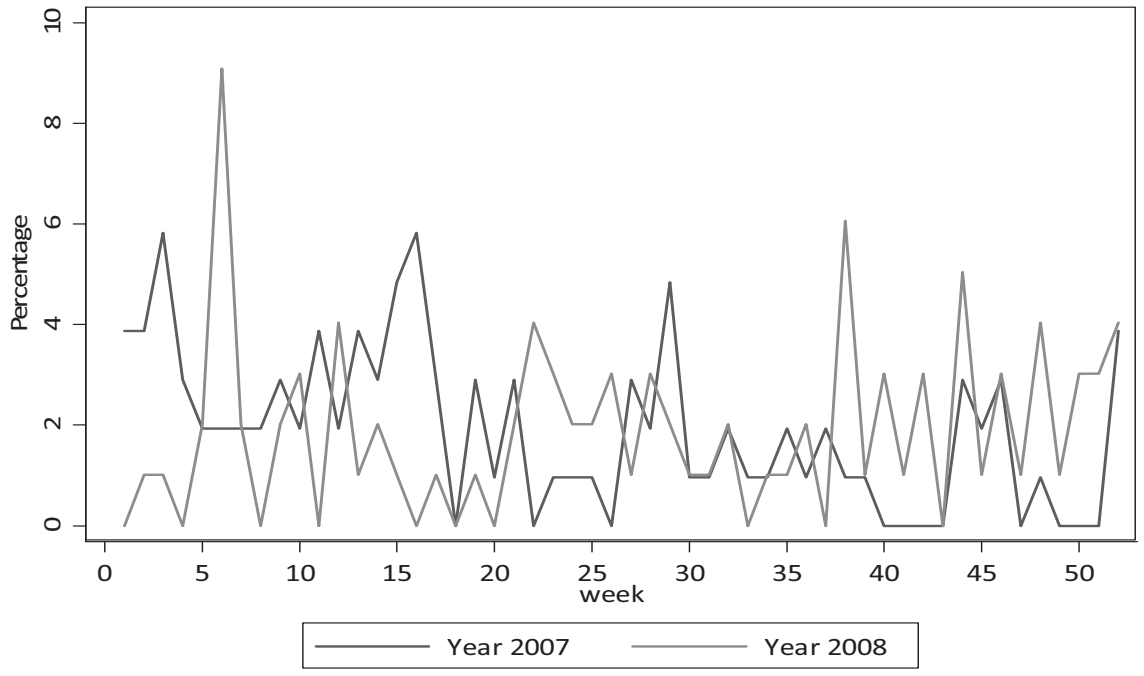
3.1 STOCK AND FLOW

There were a total of 103 cases reported in the year 2007 and 99 cases in 2008. The distribution of cases by month did not reveal any outbreak of contact lens-related keratitis in the MOH Hospitals during the year 2007 and 2008. (Table 3.1)

Table 3.1 Number of cases

	Year 2007		Year 2008		TOTAL	
Month	**No.**	**%**	**No.**	**%**	**No.**	**%**
January	18	17.5	4	4	22	10.9
February	10	9.7	12	12.1	22	10.9
March	11	10.7	9	9.1	20	9.9
April	18	17.5	4	4	22	10.9
May	7	6.8	6	6.1	13	6.4
June	3	2.9	11	11.1	14	6.9
July	11	10.7	7	7.1	18	8.9
August	6	5.8	5	5.1	11	5.4
September	6	5.8	9	9.1	15	7.4
October	1	1	11	11.1	12	5.9
November	8	7.8	10	10.1	18	8.9
December	4	3.9	11	11.1	15	7.4
TOTAL	103	51.0	99	49.0	202	100

Figure 3.1 Number of cases



3.2 DISTRIBUTION OF CASES BY CENTRE

The three hospitals with the highest number of cases reported in 2007 were Hospital Melaka, Kuala Lumpur and Hospital Sultanah Aminah Johor Bahru. In 2008 Hospital Melaka, Selayang and Sungai Buloh recorded the highest number of cases. (Table 3.2)

Table 3.2 Distribution of cases by centre

Year 2007			Year 2008		
Centre	**No.**	**%**	**Centre**	**No.**	**%**
H Ipoh	6	5.83	H Ipoh	3	3.03
H Kuala Lumpur	10	9.71	H Kuala Lumpur	8	8.08
H Kuala Terengganu	9	8.74	H Kuala Terengganu	6	6.06
H Kuching	1	0.97	H Kuching	5	5.05
H Melaka	12	11.65	H Melaka	11	11.11
H Muar	2	1.94	H Muar	3	3.03
H Pulau Pinang	2	1.94	H Pulau Pinang	4	4.04
H Kota Kinabalu	1	0.97	H Tuanku Jaafar	3	3.03
H Tuanku Jaafar	2	1.94	H Sibu	3	3.03
H Sultanah Aminah JB	8	7.77	H Sultanah Aminah JB	4	4.04
H Sungai Petani	1	0.97	H Taiping	1	1.01
H Taiping	2	1.94	H Tawau	3	3.03
H Teluk Intan	1	0.97	H Teluk Intan	3	3.03
H TAR Klang	2	1.94	H TAR Klang	4	4.04
H Kota Bharu	5	4.85	H Putrajaya	5	5.05
H Putrajaya	6	5.83	H Batu Pahat	1	1.01
H Batu Pahat	7	6.8	H Selayang	11	11.11
H Selayang	7	6.8	H Bukit Mertajam	2	2.02
H Bukit Mertajam	1	0.97	HUKM	1	1.01
HUKM	5	4.85	H Sri Manjung	1	1.01
H Sri Manjung	4	3.88	H Serdang	4	4.04
H Serdang	5	4.85	H Sg. Buloh	8	8.08
H Sg. Buloh	3	2.91	H Ampang	4	4.04
H Temerloh	1	0.97	H Temerloh	1	1.01
Total	103	100	Total	99	100

Figure 3.2(a) Distribution of cases by centre, 2007

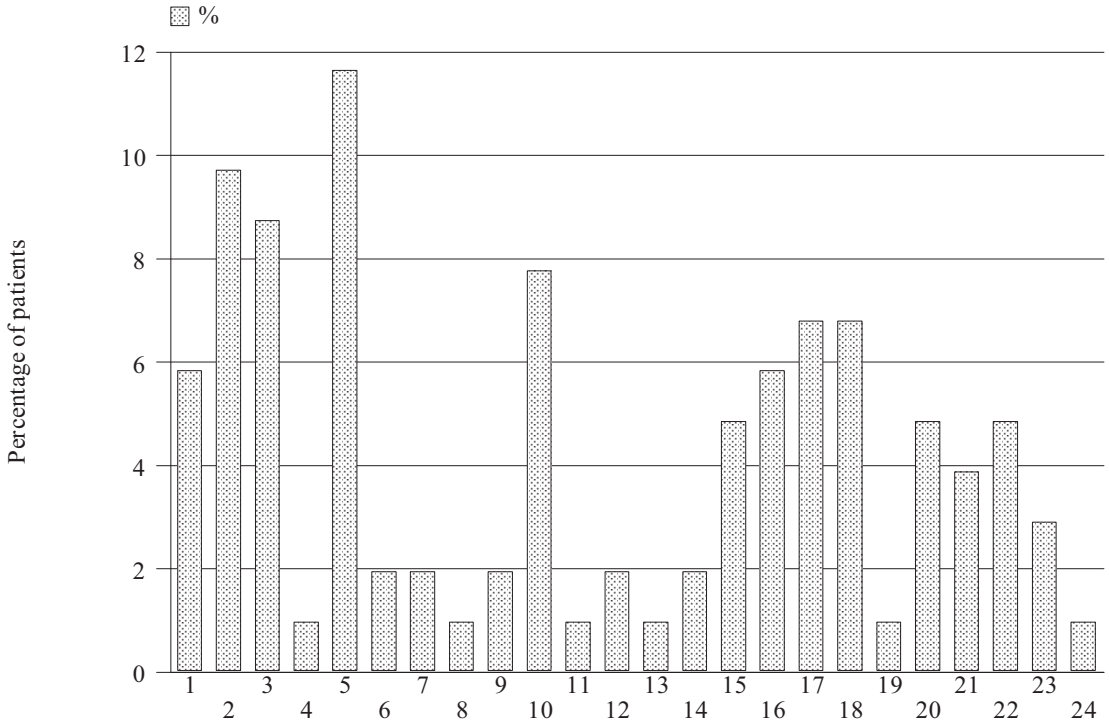
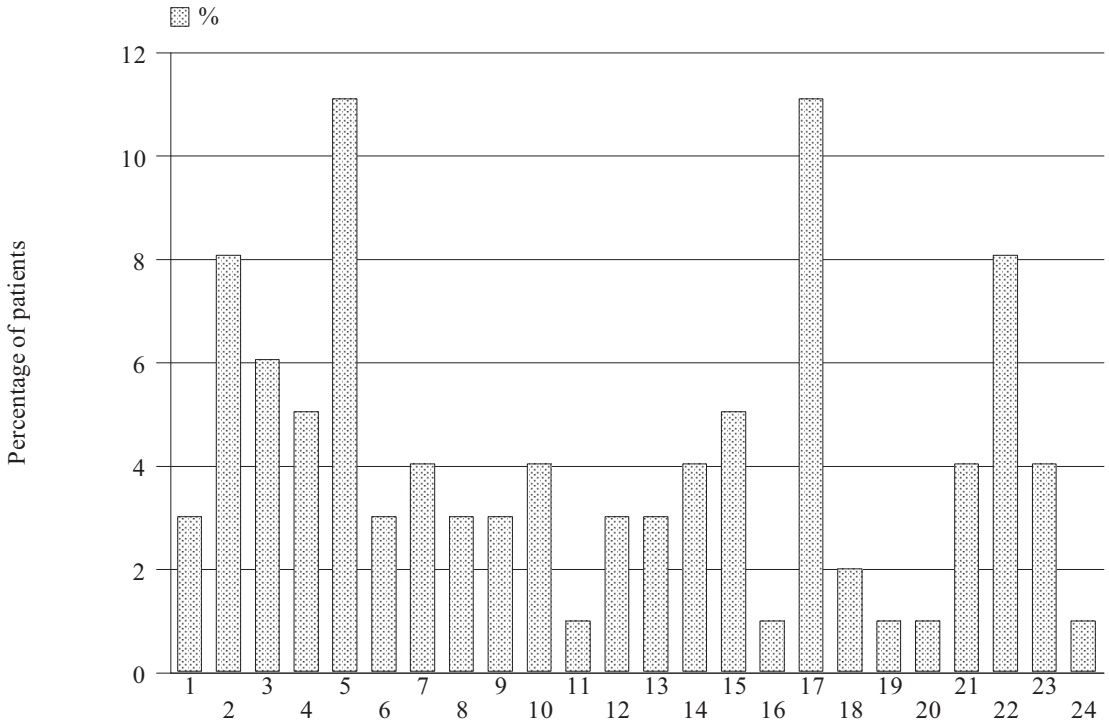


Figure 3.2(b) Distribution of cases by centre, 2008



3.3 PATIENTS DEMOGRAPHY

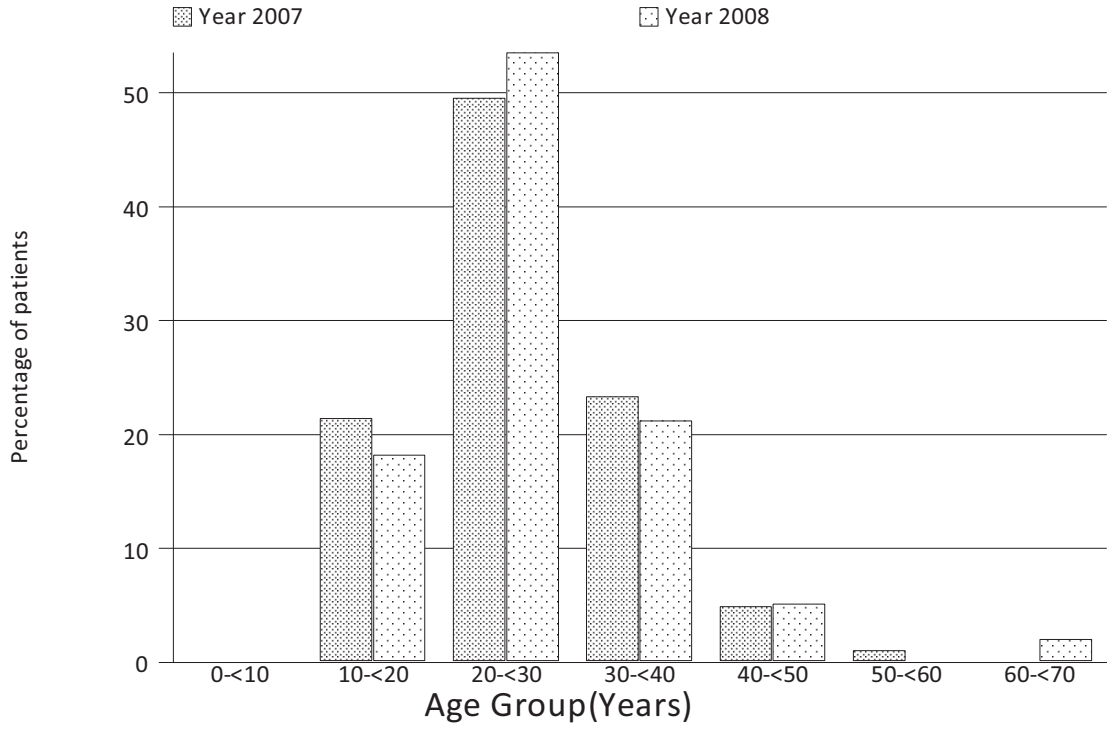
3.3.1 Age

Median age was 25 in 2007 and 24 in 2008.

Table 3.3.1 Distribution of patients by age

	Year 2007		Year 2008		Total	
Age, years (N)	103		99		202	
Mean (SD)	26.1(8.1)		26.5(8.8)		26.3(8.4)	
Median	25		24		24.5	
Min	10		15		10	
Max	51		68		68	
Distribution of age group, years	**No.**	**%**	**No.**	**%**	**No.**	**%**
0-<10	0	0	0	0	0	0
10-<20	22	21.4	18	18.2	40	19.8
20-<30	51	49.5	53	53.5	104	51.5
30-<40	24	23.3	21	21.2	45	22.3
40-<50	5	4.9	5	5.1	10	5
50-<60	1	1	0	0	1	0.5
70-<80	0	0	2	2	2	1

Figure 3.3.1 Distribution of patients by age



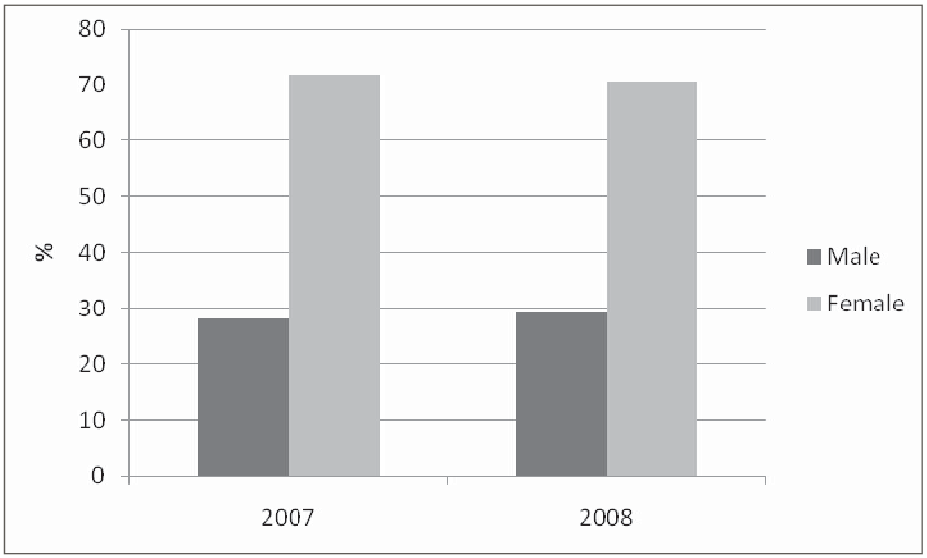
3.3.2 Gender

Majority of the patients were females (71.3%) (Table 3.3.2).

Table 3.3.2 Distribution of patients by gender

	Year 2007		Year 2008		Total	
Gender	**No.**	**%**	**No.**	**%**	**No.**	**%**
Male	29	28.2	29	29.3	58	28.7
Female	74	71.8	70	70.7	144	71.3

Figure 3.3.2 Distribution of patients by gender



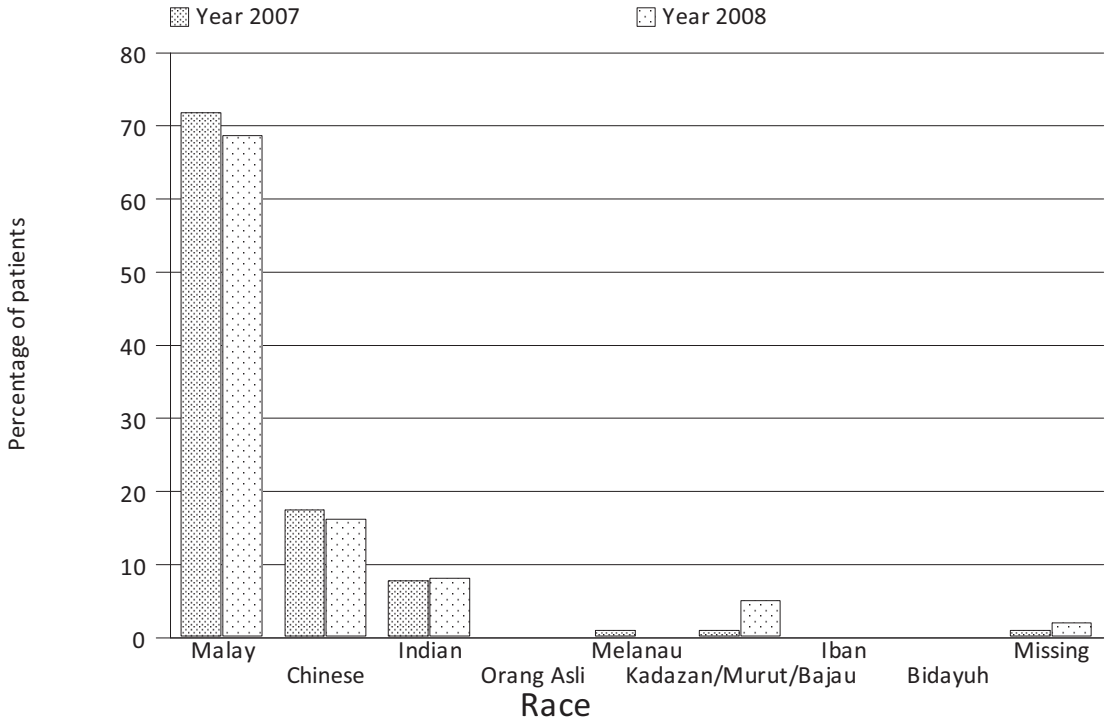
3.3.3 Ethnic

Among patients with CLRCU seen at MOH Ophthalmology clinics, Malays were the majority.

Table 3.3.3 Distribution of patients by ethnicity

	Year 2007		Year 2008		Total	
Ethnic	**No.**	**%**	**No.**	**%**	**No.**	**%**
Malay	74	71.8	68	68.7	142	70.3
Chinese	18	17.5	16	16.2	34	16.8
Indian	8	7.8	8	8.1	16	7.9
Orang Asli	0	0	0	0	0	0
Melanau	1	1	0	0	1	0.5
Kadazan/Murut/Bajau	1	1	5	5.1	6	3
Iban	0	0	0	0	0	0
Bidayuh	0	0	0	0	0	0
Missing	1	1	2	2	3	1.5

Figure 3.3.3 Distribution of patients by ethnicity



3.4 DATA ON CONTACT LENS RELATED CORNEAL ULCER AT PRESENTATION

Bilateral eye involvement was seen in 6 cases in 2007 and 10 cases in 2008. (Table 3.4.1)

Table 3.4.1 Affected eye(s)

	Year 2007		Year 2008		
No. of patients	**No.**	**%**	**No.**	**%**	**Total**
Right	56	51.38	57	52.29	113
Left eye	50	45.87	50	45.87	100
Missing	3	2.75	2	1.84	5
Total	109	100	109	100	202

Trauma was not a predisposing factor in the majority of cases. (Table 3.4.2)

Table 3.4.2 History of trauma

	Year 2007		Year 2008		Total	
History of trauma	**No.**	**%**	**No.**	**%**	**No.**	**%**
Yes	3	2.8	5	4.6	8	3.7
No	104	95.4	99	90.8	203	93.1
Missing	2	1.8	5	4.6	7	3.2

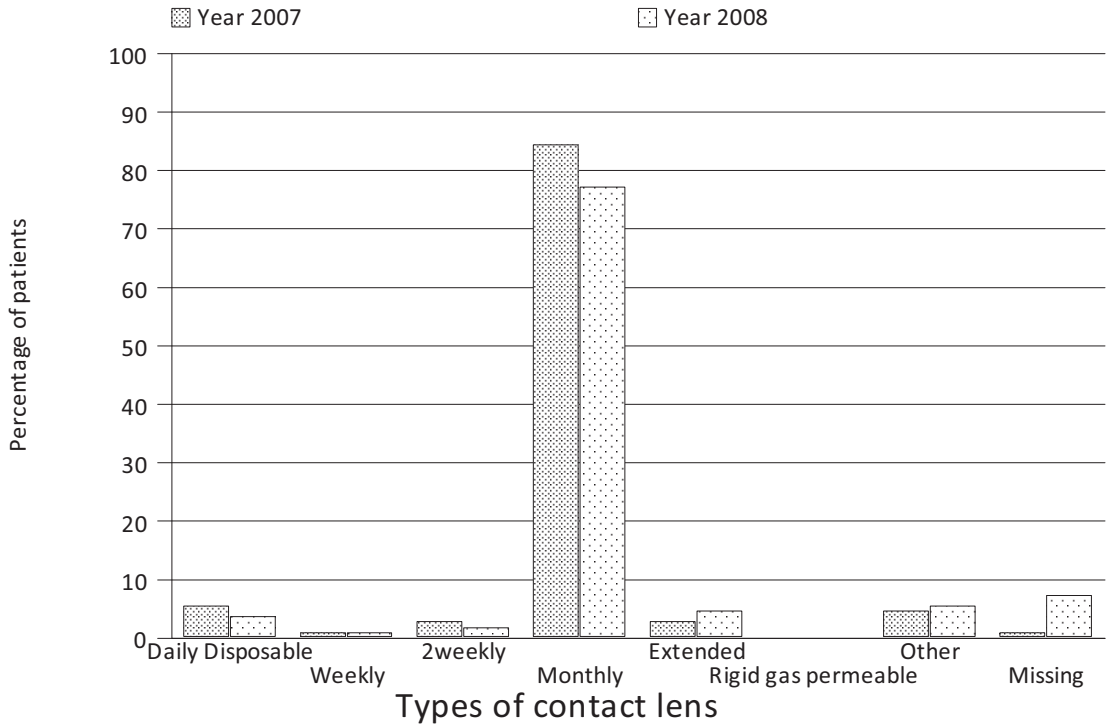
The majority of the contact lens-related corneal ulcers were seen among those who used monthly disposable contact lens. (Table 3.4.3)

Table 3.4.3 Types of contact lens worn at diagnosis

No	Types of contact lens	Year 2007		Year 2008		Total	
		No.	%	No.	%	No.	%
1	Daily disposable	6	5.5	4	3.7	10	4.5
2	Weekly disposable	1	0.9	1	0.9	2	0.9
3	2 weekly disposable	3	2.8	2	1.8	5	2.3
4	Monthly disposable	92	84.4	84	77.1	176	79.6
5	Extended wear	3	2.8	5	4.6	8	3.6
6	Rigid gas permeable	0	0	0	0	0	0
7	Others	5	4.6	6	5.5	11	5
8	Missing	1	0.9	8	7.3	9	4.1

*multiple checks were allowed for types of contact lens.

Figure 3.4.3 Types of contact lens worn at diagnosis

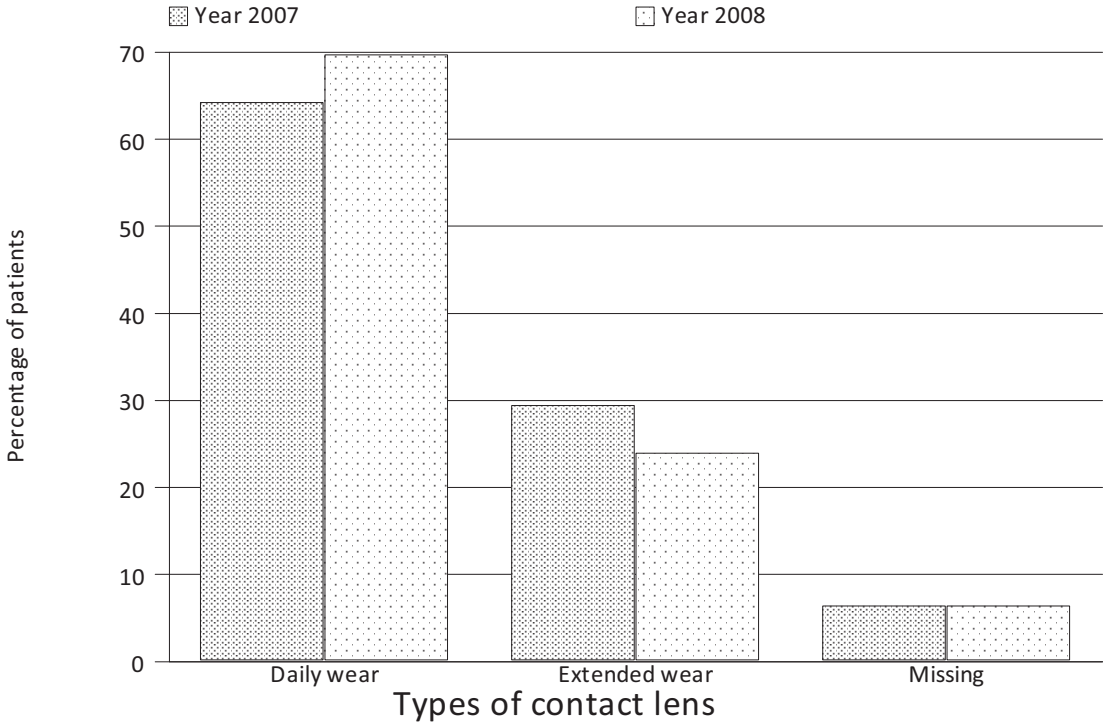


About a quarter of the cases failed to remove lens before sleep. (Table 3.4.4)

Table 3.4.4 Contact lens wearing pattern at diagnosis

Wearing pattern	Year 2007		Year 2008		Total	
	No	%	No	%	No	%
Daily wear	70	64.2	76	69.7	146	67.0
Extended wear	32	29.4	26	23.9	58	26.6
Missing	7	6.4	7	6.4	14	6.4

Figure 3.4.4 Contact lens wearing pattern at diagnosis



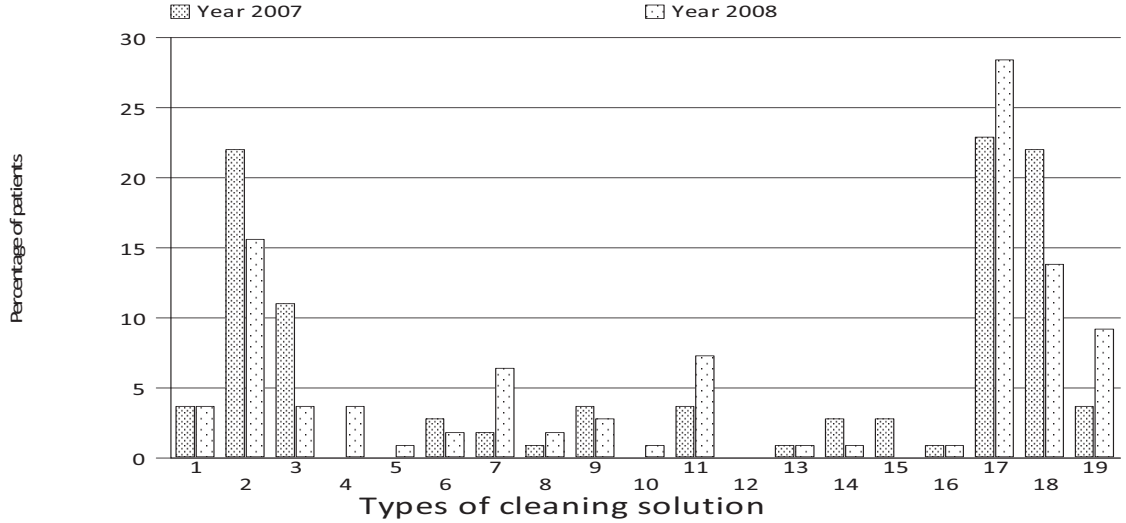
The most popular choice of contact lens cleaning solution among the cases were from Bausch and Lomb

Table 3.4.5 Types of cleaning solution used at diagnosis

No	Types of cleaning solution	Year 2007		Year 2008		Total	
		No	%	No	%	No.	%
1	Alcon	4	3.7	4	3.7	8	3.5
2	Bausch and Lomb	24	22	17	15.6	41	18.1
3	Allergan (AMO)	12	11	4	3.7	16	7
4	Ciba Vision	0	0	4	3.7	4	1.8
5	Opto-medic	0	0	1	0.9	1	0.4
6	Freskon	3	2.8	2	1.8	5	2.2
7	Sauflon	2	1.8	7	6.4	9	4
8	Multisoft	1	0.9	2	1.8	3	1.3
9	I-Gel	4	3.7	3	2.8	7	3.1
10	Medivue	0	0	1	0.9	1	0.4
11	Normal Saline	4	3.7	8	7.3	12	5.3
12	Simvue	0	0	0	0	0	0
13	Multimate	1	0.9	1	0.9	2	0.9
14	Pharmasafe Multipurpose solution	3	2.8	1	0.9	4	1.8
15	Tap water	3	2.8	0	0	3	1.3
16	Do not use because of daily wear	1	0.9	1	0.9	2	0.9
17	Not known	25	22.9	31	28.4	56	24.7
18	Others	24	22	15	13.8	39	17.2
19	Missing	4	3.7	10	9.2	14	6.2

*multiple checks were allowed for cleaning solution.

Figure 3.4.5 Types of cleaning solution used at diagnosis



About 1/3 of the cases had an unaided vision of 3/60 or worse at the time of presentation.

Table 3.4.6(a) Vision at presentation

Presenting visual acuity	Unaided, 2007		Best corrected, 2007		Unaided, 2008		Best Corrected, 2008	
	N=109		N=109		N=109		N=109	
	No.	%	No.	%	No.	%	No.	%
• 6/5	0	0	0	0	0	0	0	0
• 6/6	5	4.6	13	11.9	2	1.8	5	4.6
• 6/9	7	6.4	11	10.1	5	4.6	14	12.8
• 6/12	7	6.4	19	17.4	6	5.5	14	12.8
6/5 to 6/12	**19**	**17.4**	**43**	**39.4**	**13**	**11.9**	**33**	**30.3**
• 6/18	11	10.1	10	9.2	8	7.3	18	16.5
• 6/24	14	12.8	6	5.5	10	9.2	7	6.4
• 6/36	6	5.5	2	1.8	12	11	6	5.5
• 6/60	7	6.4	2	1.8	18	16.5	3	2.8
• 5/60	1	0.9	0	0	1	0.9	1	0.9
• 4/60	3	2.8	1	0.9	2	1.8	0	0
6/18 to 4/60	**42**	**38.5**	**21**	**19.2**	**51**	**46.8**	**35**	**32.1**
• 3/60	3	2.8	1	0.9	3	2.8	2	1.8
• 2/60	1	0.9	0	0	2	1.8	0	0
• 1/60	3	2.8	3	2.8	0	0	0	0
• CF	12	11	5	4.6	7	6.4	1	0.9
• HM	16	14.7	9	8.3	14	12.8	12	11
• PL	1	0.9	1	0.9	5	4.6	2	1.8
• NPL	0	0	0	0	0	0	0	0
3/60 or worse	**36**	**33.1**	**19**	**17.5**	**31**	**28.4**	**17**	**15.6**
Missing	**12**	**11**	**26**	**23.9**	**14**	**12.9**	**24**	**22**

Figure 3.4.6(a) Vision at presentation, January-December 2007

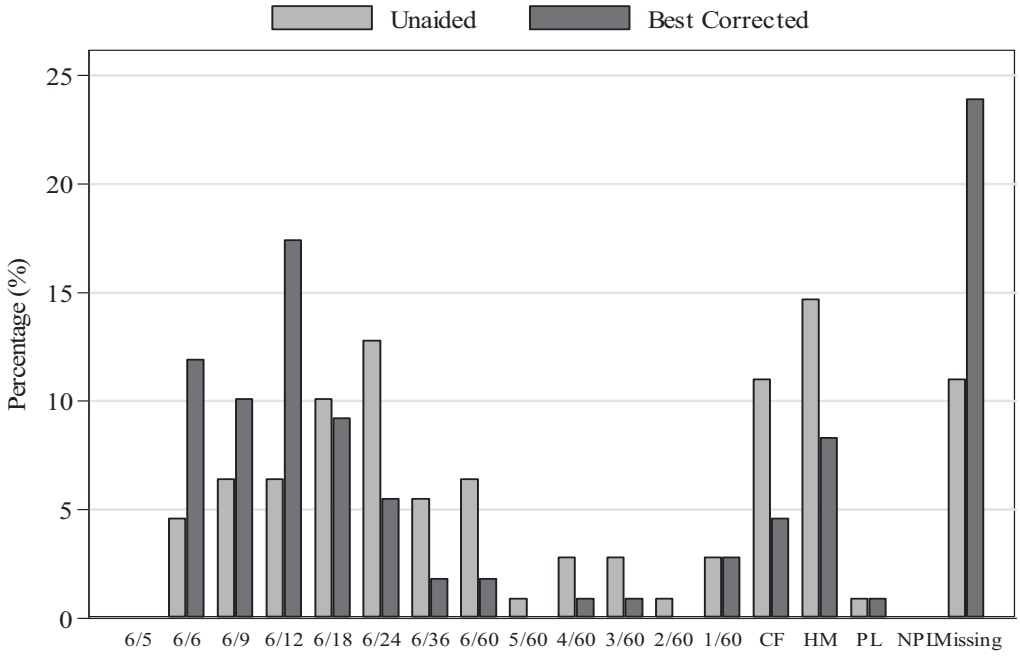
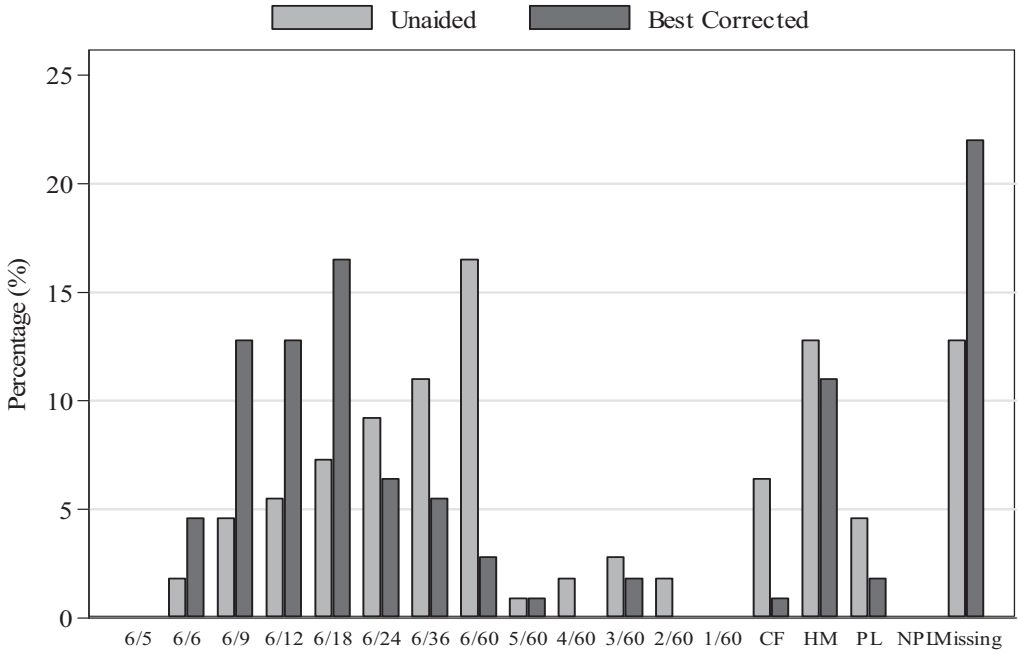


Figure 3.4.6(b) Vision at presentation, January-December 2008



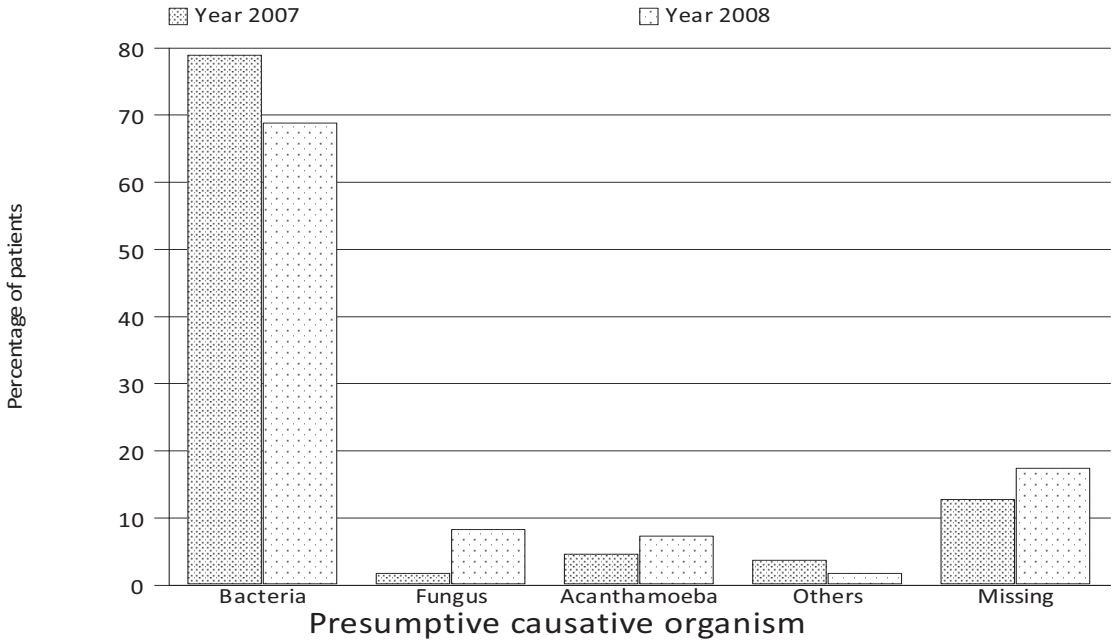
The initial clinical impression of the clinician as to the causative agent of the corneal ulcer was recorded as presumptive causative organism. Eighty seven percent of the cases were presumptively treated as bacterial corneal ulcer.

Table 3.4.7 Presumptive causative organism

	Year 2007		Year 2008		Total	
Presumptive causative organism	**No.**	**%**	**No.**	**%**	**No.**	**%**
Bacteria	86	78.9	75	68.8	161	87
Fungus	2	1.8	9	8.3	11	5.9
Acanthamoeba	5	4.6	8	7.3	13	7.0
Others	4	3.7	2	1.8	6	3.2
Missing	14	12.8	19	17.4	33	17.8

*multiple checks done to the presumptive causative organism were allowed.

Figure 3.4.7 Presumptive causative organism



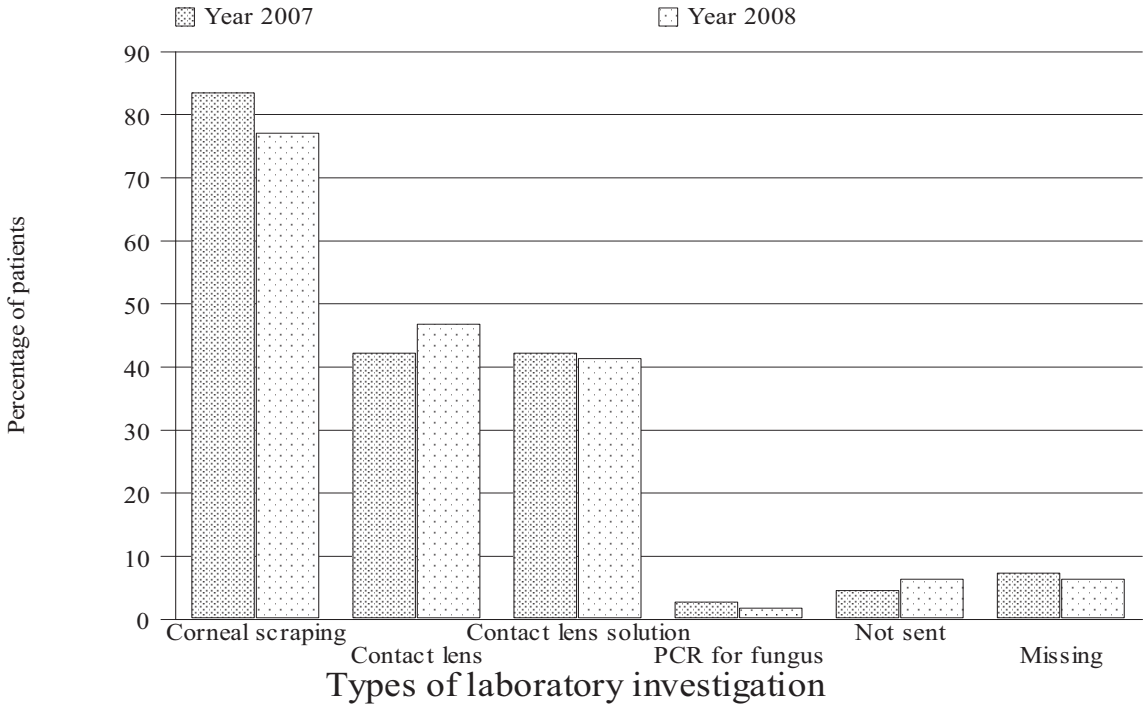
Cornea scraping was performed in 80% of the eyes. The contact lens and contact lens cleaning solution were sent for microbiological examination in less than half of the cases.

Table 3.4.8 Types of Laboratory investigations

		Year 2007		Year 2008		Total	
No	**Types of laboratory investigation**	**No.**	**%**	**No.**	**%**	**No.**	**%**
1	Corneal scraping	91	83.5	84	77.1	175	80.3
2	Contact lens	46	42.2	51	46.8	97	44.5
3	Contact lens solution	46	42.2	45	41.3	91	41.7
4	PCR for fungus	3	2.8	2	1.8	5	2.3
5	Not sent	5	4.6	7	6.4	12	5.5
6	Missing	8	7.3	7	6.4	15	6.9

*Multiple checks done to the types of laboratory investigation were allowed.

Figure 3.4.8 Types of Laboratory investigations



The rate of positive culture results for corneal scraping was 37.4% in 2007 and 36.9% in 2008. Bacteria were the most frequently isolated organism from cornea scrapping, contact lens and contact lens solution. (Table 3.4.9) Pseudomonas was the most common bacterial isolate from corneal scraping, contact lens and contact lens solution. (Table 3.4.10)

Table 3.4.9 Results of laboratory investigations

	Year 2007						Year 2008					
	Corneal scraping		Contact lens		Contact lens solution		Corneal scraping		Contact lens		Contact lens solution	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Bacteria	34	37.4	26	56.5	16	34.8	31	36.9	16	31.4	12	26.7
Acanthamoeba	1	1.1	0	0	0	0	0	0	0	0	0	0
Fungal	1	1.1	1	2.2	0	0	2	2.4	2	3.9	0	0
Others	0	0	1	2.2	3	6.5	1	1.2	3	5.9	1	2.2
Negative	46	50.5	13	28.3	17	37	38	45.2	18	35.3	21	46.7
Missing data	4	4.4	1	2.2	2	4.3	1	1.2	1	2	2	4.4
Not available	7	7.7	5	10.9	9	19.6	11	13.1	11	21.6	9	20

*Multiple checks were allowed for corneal scraping, contact lens and contact lens solution.

Figure 3.4.9(a) Results of laboratory investigations, January-December 2007

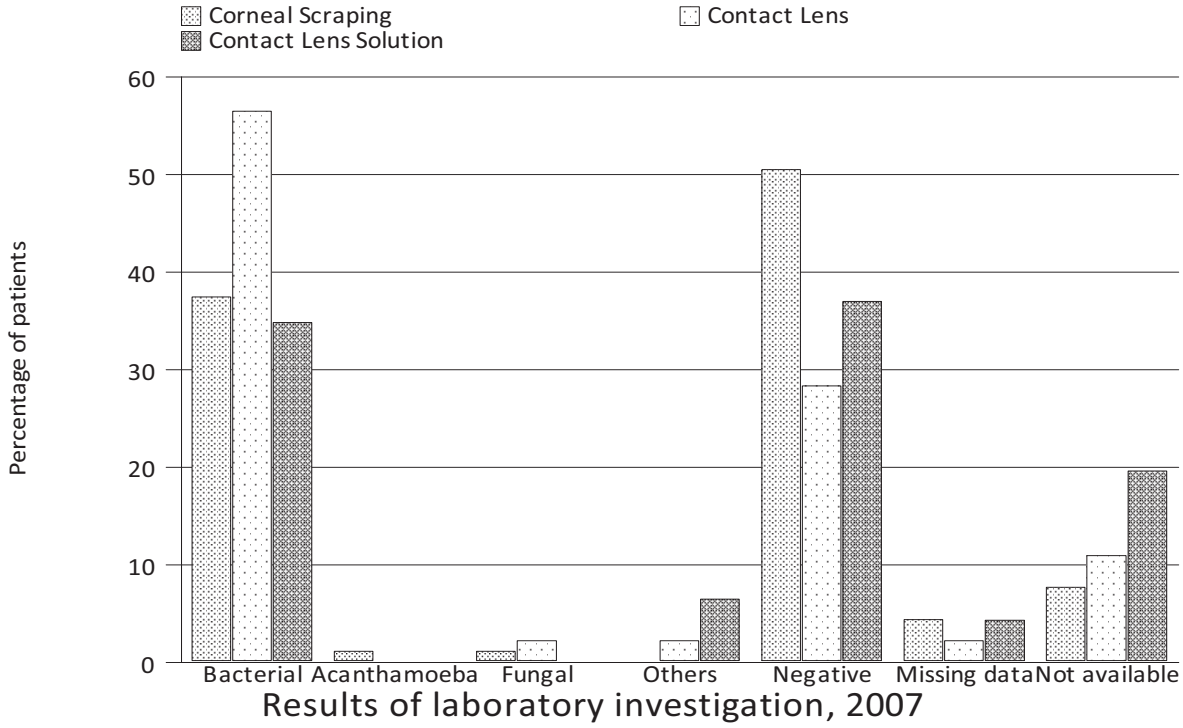


Figure 3.4.9(b) Results of laboratory investigations, January-December 2008

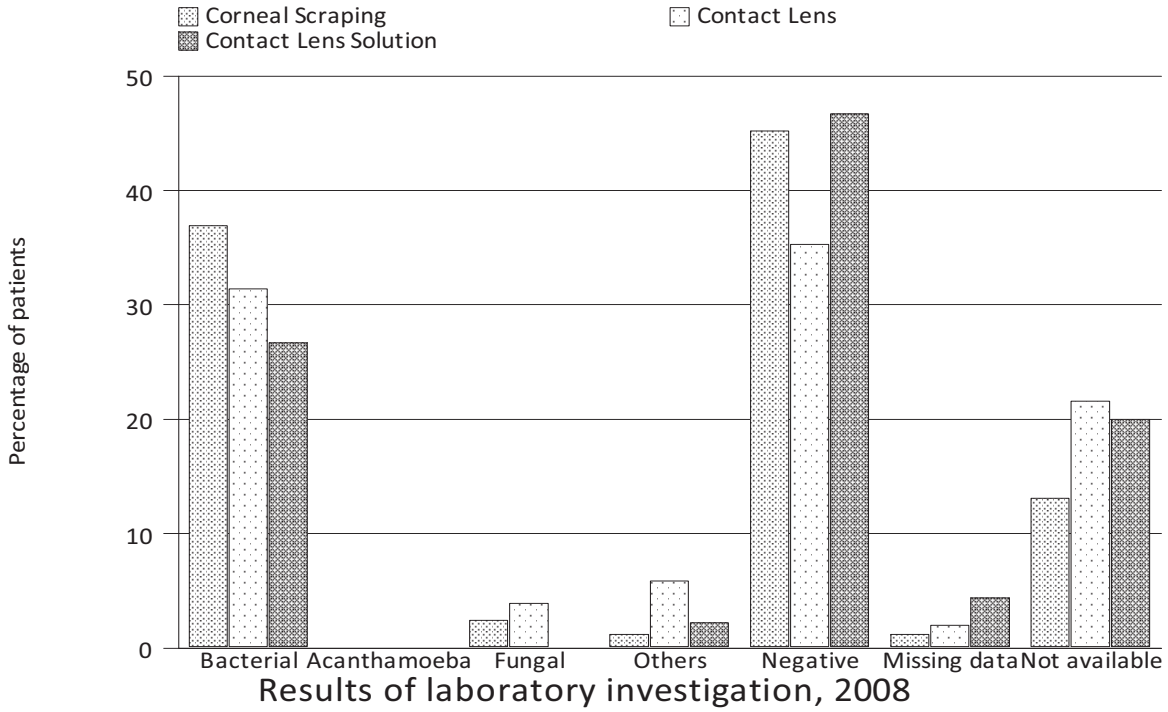


Table 3.4.10 Bacteria specify for each types of lab investigation

	Year 2007		Year 2008		Total	
Bacteria	**No.**	**%**	**No.**	**%**	**No.**	**%**
Corneal scraping (n)	34		31		65	
Pseudomonas	27	79.4	28	90.3	55	84.6
Enterobacter	3	8.8	0	0	3	1.3
Staph. epidermidis	1	2.9	0	0	1	1.5
Acinetobacter	1	2.9	0	0	1	1.5
Serratia Marcescens	1	2.9	0	0	1	1.5
Missing	1	2.9	3	9.7	4	6.2
Contact lens (n)	26		16		42	
Pseudomonas	20	76.9	16	100	36	85.7
Enterobacter	3	11.5	0	0	3	7.1
Klebsiella	1	3.8	0	0	1	2.4
Burkholdenia cepacia	1	3.8	0	0	1	2.4
Serratia Marcescens	1	3.8	0	0	1	2.4
Contact lens solution (n)	16		12		28	
Pseudomonas	13	81.3	12	100	25	89.3
Enterobacter	1	6.3	0	0	1	3.6
Klebsiella	1	6.3	0	0	1	3.6
Coagulase negative Staphylococcal	1	6.3	0	0	1	3.6
Serratia Marcescens	0	0	0	0	0	0

Table 3.4.11 Results of laboratory investigations (PCR)

	PCR, Year 2007		PCR, Year 2008	
	No.	**%**	**No.**	**%**
Detected	0	0	0	0
Not detected	1	33.3	1	50
Not sent	0	0	1	50
Missing	2	66.7	0	0

3.5 OUTCOME BY ONE MONTH AFTER PRESENTATION

About 30% had normal - corrected vision at one month after presentation (Table 3.5.1)

Table 3.5.1 Vision by one month

Presenting Visual acuity	Year 2007 N=109				Year 2008 N=109			
	Unaided		Best corrected		Unaided		Best corrected	
	No.	%	No.	%	No.	%	No.	%
• 6/5	1	0.9	0	0	0	0	0	0
• 6/6	4	3.7	22	20.2	2	1.8	13	11.9
• 6/9	4	3.7	11	10.1	3	2.8	15	13.8
• 6/12	10	9.2	3	2.8	4	3.7	5	4.6
6/5 to 6/12	**19**	**17.43**	**36**	**33**	**9**	**8.3**	**33**	**30.3**
• 6/18	8	7.3	4	3.7	11	10.1	7	6.4
• 6/24	10	9.2	3	2.8	8	7.3	2	1.8
• 6/36	9	8.3	1	0.9	5	4.6	0	0
• 6/60	16	14.7	1	0.9	2	1.8	0	0
• 5/60	2	1.8	0	0	1	0.9	0	0
• 4/60	0	0	0	0	0	0	0	0
6/18 to 3/60	**45**	**41.3**	**9**	**8.3**	**27**	**24.7**	**9**	**8.3**
• 3/60	1	0.9	0	0	0	0	0	0
• 2/60	1	0.9	0	0	0	0	0	0
• 1/60	0	0	0	0	1	0.9	0	0
• CF	3	2.8	1	0.9	3	2.8	1	0.9
• HM	3	2.8	2	1.8	2	1.8	1	0.9
• PL	0	0	0	0	2	1.8	1	0.9
• NPL	0	0	0	0	0	0	0	0
3/60 or worse	**8**	**7.3**	**3**	**2.8**	**8**	**7.3**	**3**	**2.8**
Missing	37	33.9	61	56	65	59.6	64	58.7

Figure 3.5.1(a) Vision by one month, 2007

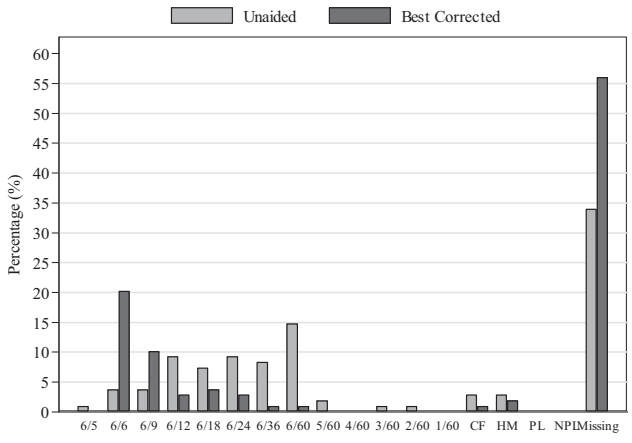
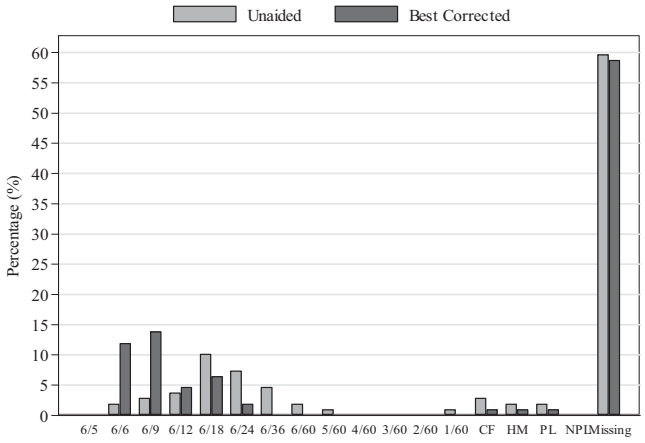


Figure 3.5.1(b) Vision by one month, 2008

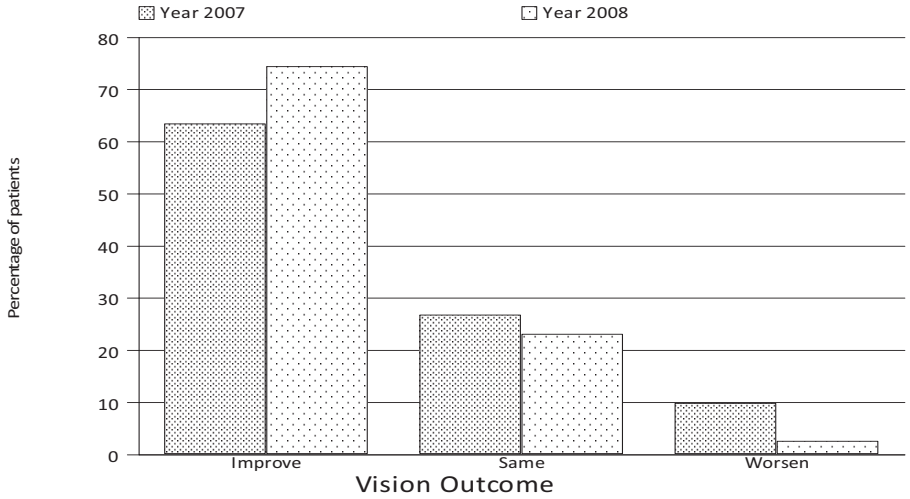


Vision status was recorded from patients when both vision at presentation and vision at one month were available. Vision improved in 58.75% of the affected eyes. (Table 3.5.2)

Table 3.5.2 Vision outcomes from presentation to one month after presentation

Vision outcomes	Year 2007		Year 2008		Total	
	No.	%	No.	%	No.	%
Improved	26	63.4	29	74.4	55	68.75
Same	11	26.8	9	23.1	20	25
Worsened	4	9.8	1	2.5	5	6.25

Figure 3.5.2 Vision Outcome- from presentation to one month after presentation



In 2008, three cases were complicated by corneal perforation. Two cases were managed by corneal gluing and one by penetrating keratoplasty.

Table 3.5.3 Patients requiring surgical intervention

No	Surgical intervention	Year 2007		Year 2008		Total	
		No	%	No	%	No	%
1	Corneal perforation	0	0	3	2.8	3	50
2	Penetrating keratoplasty	0	0	1	0.9	1	16.67
3	Eviseration	0	0	0	0	0	0
4	Cornea gluing	0	0	2	1.8	2	33.33
5	Other	0	0	0	0	0	0

Chapter 4

Glaucoma Registry

Contributing Editors

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CHAPTER 4 GLAUCOMA REGISTRY

4.1 INTRODUCTION

In 2009, a total of 23 SDPs, consisting of MOH ophthalmology departments collected data for the glaucoma registry. A total of 4481 patients were registered, 3952 (88.2%) were follow up cases and 503 (11.2%) new cases with 26 (0.6%) missing data.

4.2 CHARACTERISTICS OF PATIENTS

From the available data, the median age of patients was within the range of 60-69 years. There were 46% male and 54% female. Majority of patients were unemployed (77.4%). The proportion of patients registered differs from the national ethnic distributions; Chinese was the highest (41.5%), followed by Malays (36%), Indians (17.8%) and others (4.7%).

4.3 MEDICAL HISTORY

Of the patients registered, 67.7% have systemic co-morbidity. Hypertension and diabetes mellitus were among the most common (Refer Table 1). A total of 113 patients had family history of glaucoma and 55 patients had history of steroid usage.

Table 4.1: Distribution of medical co-morbidity

Medical co-morbidity	**No. of patient**
Diabetes	1546 (39.4%)
Hypertension	1687 (43.0%)
Hypercholesterolemia	305 (7.8%)
Cardiac disease	287 (7.3%)
Stroke	45 (1.1%)
Vasosapatic disease	18 (0.5%)
Respiratory disease	33 (0.8%)

4.4 CLINICAL FEATURES

4.4.1 Visual acuity

Among the eyes with recorded visual acuity, 5317 (65.9%) had vision of 6/12 or better, 1746 (21.6%) had low vision (6/18-4/60) while 604 (7.5%) were legally blind and 401 (5%) had no perception to light (Refer Table 2**).**

4.4.2. Cup disc ratio

More than 76.4% of the eyes had cup disc ratio (CDR) of 0.5 or larger while 18.5% had an advanced stage of glaucomatous cupping (CDR of 0.9 and 1.0) (Refer Table 2).

Table 2: Distribution of visual acuity and cup disc ratio

	Cup disc ratio												
VA	1	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	Undetermined	No view	Total eyes
6/12 or better	280	635	780	747	787	841	436	464	12	4	90	241	5317
6/18-4/60	107	227	217	214	296	265	164	163	13	1	31	51	1749
3/60-PL	51	82	80	78	92	69	56	56	0	0	14	26	604
NPL	44	64	54	54	54	49	28	26	0	0	8	20	401

4.4.3 Types of Glaucoma

Majority of the eyes (69.1%) had primary type of glaucoma with 10% having secondary glaucoma and 15.6% suspected to have glaucoma. Among the primary type of glaucoma, primary open angle glaucoma was the most common (67.5%) followed by primary angle closure glaucoma (15.5%), ocular hypertension (4.8%), primary angle closure (1.5%), primary angle closure suspect (0.8%) and others (9.9%). As for secondary type of glaucoma, the few common types of glaucoma were post-surgery (15.9%), pseudoexfoliative (14.9%), rubeotic (14.5%), post-trauma (11.7%), Steroid-induced (6.5%) and inflammatory (6%).

4.5 MANAGEMENT OF GLAUCOMA

Medical treatment was the most common mode of management. The eyes were treated either as monotherapy or in combination. The most frequent eye drop prescribed was beta blockers, followed closely by prostaglandin analog and the others were topical CAI, alpha adrenergic and cholinergics (Refer Table 3).

Some eyes had procedures performed either in combination with medical treatment or as a single mode of management. The most common laser performed was laser iridotomy while trabeculectomy was the most frequent surgical operation performed. (Refer Table 4 and Table 5)

Table 4.3: Types of antiglaucoma agents prescribed

Types of medication	**Right Eye**	**Left Eye**
Beta blockers	2565 (46.8%)	2505 (46.7%)
Prostaglandin analog	1814 (33.1%)	1786 (33.3 %)
Alpha adrenergic	159 (2.9%)	145 (2.7%)
Topical CAI	822 (15%)	790 (14.7%)
Cholinergics	82 (1.5%)	83 (1.6%)
Systemic CAI	32 (0.6%)	40 (0.8%)
Hyperosmotic agents	8 (0.1%)	6 (0.1%)
Others	0	6 (0.1%)

Table 4: Types of laser procedures performed

Types of laser	**RE (n=436 eyes)**	**LE (n=407 eyes)**
Laser iridotomy	366 (83.9%)	358 (88%)
Laser iridoplasty	13 (3.0%)	10 (2.4%)
laser trabeculoplasty	16 (3.7%)	12 (2.9%)
TSCPC	34 (7.8%)	21 (5.2%)
Endocylodiode laser	2 (0.5%)	0
Others	5 (1.1%)	6 (1.5%)

Table 5: Types of surgical procedures performed

Types of laser	**RE (n=412 eyes)**	**LE (n=409 eyes)**
Trabeculectomy	304 (73.8%)	301 (73.6%)
Drainage device	9 (2.2%)	9 (2.2%)
Needling	3 (0.7%)	4 (1.0%)
Non penetrating surgery	1 (0.2%)	2 (0.5%)
Cryotherapy	2 (0.5%)	3 (0.7)
Surgical PI	30 (7.3%)	31 (7.6%)
Trabeculotomy	10 (2.4%)	13 (3.2%)
Goniotomy	0	0
Others	53 (12.9%)	46 (11.2%)

Chapter 5

Age Related Macular Degeneration Registry

Contributing Editor

Dr Tara Mary George

CHAPTER 5 AGE RELATED MACULAR DEGENERATION REGISTRY

Introduction

The AMD Registry commenced in August 2008. This data is from the initial period from August 2008 till June 2009 and is a pilot study that contains data on 52 AMD patients with 104 eyes who were seen for the first time at the Medical Retina unit of Hospital Selayang. The mean age of patients was 65.6 years and the mean duration of symptoms was 15.4 months. About thirty-eight percent (38.5%) of eyes of AMD cases presented with VA of 6/5 – 6/12, 23.1% presented with VA 6/24 -3/60 and another 38.5% presented with VA 3/60 or worse. Of these, 50% of eyes had exudative AMD of which 27.2% had disciform scars. Central geographic atrophy was present in 8.6 % of eyes, 14.8 % eyes had polypoidal choroidal vasculopathy and 18.5% eyes had active choroidal neovascularisation.
AMD Registry results show that majority of patients present late to the tertiary referral centre. This indicates that the public awareness on the importance of symptoms of AMD should be emphasized so that patients may be treated at an earlier stage.

5.1 PATIENTS DEMOGRAPHY

Table 5.1.1 Demography

Age, years	**N=52**	
Mean	65.6	
SD	10.2	
Median	68	
Minimum	42	
Maximum	86	
Age group, years	No.	%
Less than 40 yrs	0	0
40-49 yrs	5	9.6
50-59 yrs	8	15.4
60-69 yrs	22	42.3
70-79 yrs	13	25
80-89 yrs	4	7.7
>90 yrs	0	0
Gender		
Male	28	53.8
Female	24	46.2
Ethnicity		
Malay	23	44.2
Chinese	21	40.4
Indian	7	13.5
Orang Asli	0	0
Melanau	0	0
Kadazan/Murut/Bajau	0	0
Bidayuh	0	0
Iban	0	0
Other	1	1.9
Missing	0	0

5.12 Affected eye

	Right eye only		Left eye only		Both eyes	
	No	%	No	%	No	%
No of patients	6	11.6	15	28.8	31	59.6
Total affected eyes	83					

5.2 RISK FACTORS

Table 5.2.1 Risk factors by person

	N=52	
	No	**%**
None	15	28.8
DM	14	26.9
HPT	22	42.3
Past Stroke	1	1.9
IHD	6	11.5
Hypercholesterolemia	6	11.5
Smoking –yes	15	28.8
Current smoker	2	13.3
Past smoker	7	46.7

Table 5.2.2 Risk factors in the affected eye

	n
Had cataract surgery within last 3 months	1
Eyes with myopia	4
Degree of myopia	
< 2d	0
2 to 8D	0
> 8D	2
Missing	2

5.3 QUALITY OF LIFE

Table 5.3 Quality of Life that may be related with the problem

	N	%
Currently driving	23	50
Currently driving and have difficulty during daytime in familiar time	9	39.1
Currently not driving	23	50
Reason for not driving		
1) never drive	14	60.9
2) gave up because of poor eye sight	2	8.7
3) others	0	0
Difficulty reading ordinary print in newspaper	29	63

5.4 MEDICAL HISTORY

Table 5.4 Ocular History of the affected eye

	N=82	
	No	%
Metamorphopsia	20	16.3
Scotoma	34	27.6
Blurring of vision	55	44.7
Metamorphopsia only	3	2.4
Metamorphopsia and scotoma	3	2.4
Metamorphopsia and scotoma and blurring of vision	8	6.5
Duration of symptoms (month)		
Mean	34	
Maximum	55	
Minimum	3	

Each eye may have more than one symptom

5.5 VISION STATUS

Table 5.6(b) Status of vision in the affected eyes

	Unaided		With glasses/ pin hole	
	No	%	No	%
6/5	0	0.0	0	0.0
6/6	4	4.8	1	1.2
6/9	2	2.4	8	9.6
6/12	4	4.8	8	9.6
6/5 to 6/12	10	12.05	17	20.48
6/18	7	8.4	8	9.6
6/24	11	13.3	8	9.6
6/36	8	9.6	6	7.2
6/60	7	8.4	3	3.6
5/60	2	2.4	0	0.0
4/60	0	0.0	0	0.0
3/60	1	1.2	0	0.0
6/18 to 3/60	36	43.4	25	30.1
2/60	1	1.2	1	1.2
1/60	0	0.0	0	0.0
CF	23	27.7	3	3.6
HM	4	4.8	0	0.0
PL	0	0.0	0	0.0
NPL	1	1.2	0	0.0
2/60 to NPL	29	34.9	4	4.8
Unable to take vision	8	9.6	37	44.6
All	83	100	83	100

Table 5.6(c) Status of unaided vision in the affected eyes, by age

Visual Acuity(VA)	Age group (in yrs)							
	40-59		60-79		>80		All age group	
	No.	%	No.	%	No.	%	No.	%
6/5	0	0.0	0	0.0	0	0.0	0	0.0
6/6	3	15.0	0	0.0	1	14.3	4	4.8
6/9	1	5.0	1	0.2	0	0.0	2	2.4
6/12	2	10.0	2	0.4	0	0.0	4	4.8
6/5 to 6/12	6	30.0	3	0.5	1	14.3	10	12.0
6/18	1	5.0	6	10.7	0	0.0	7	8.4
6/24	2	10.0	8	14.3	1	14.3	11	13.3
6/36	0	0.0	7	12.5	1	14.3	8	9.6
6/60	3	15.0	4	7.1	0	0.0	7	8.4
5/60	0	0.0	2	3.6	0	0.0	2	2.4
4/60	0	0.0	0	0.0	0	0.0	0	0.0
3/60	0	0.0	1	1.8	0	0.0	1	1.2
6/18 to 3/60	6	30.0	28	50.0	2	28.6	36	43.4
2/60	0	0.0	1	1.8	0	0.0	1	1.2
1/60	0	0.0	0	0.0	0	0.0	0	0.0
CF	3	15.0	16	28.6	4	57.1	23	27.7
HM	1	5.0	3	5.4	0	0.0	4	4.8
PL	0	0.0	0	0.0	0	0.0	0	0.0
NPL	0	0.0	1	1.8	0	0.0	1	1.2
2/60 to NPL	4	20.0	21	37.5	4	57.1	29	34.9
Unable to take vision	4	20.0	4	7.1	0	0.0	8	9.6
Total patients	20	100.0	56	100.0	7	100.0	83	100.0

Table 5.6(d) Fundus examination

	Affected Eyes N=83	
	No	%
Exudative AMD	52	23.4
Non-exudative AMD	27	12.2
Presence of soft drusen	26	11.7
Presence of hard drusen	33	14.9
Presence of Central Geographic Atrophy	11	5.0
Presence of Pigment Epithelial Detachment	27	12.2
Presence of Subretinal Haemorrhage	23	10.4
Presence of Disciform scar	23	10.4
Total findings seen in affected eyes	222	100.0

5.7 INVESTIGATION

Table 5.7(a) OCT findings in the affected eyes

OCT Findings	Affected Eye N=83	
	N	%
Subretinal fluid	24	28.9
Pigment Epithelial detachment	27	32.5
Others	18	21.7
Total affected eyes with OCT findings	69	

Table: 5.7(b) FFA findings in the affected eyes

FFA Findings	Affected eyes with FFA done N=20	
Had CNV	18	
Had Scar	6	
Had PED	2	
For those with CNV	N=18	
Type of CNV	N	%
• Classic	6	33.3
• Minimally classic	1	5.6
• Predominantly classic	0	0.0
• Occult	8	44.4
• Missing	3	16.7
Location of CNV	N	%
• Subfoveal CNV	2	11.1
• Juxtafoveal CNV	3	16.7
• Extrafoveal CNV	2	11.1
• Missing	11	61.1

Table 5.7(c) ICG findings in the affected eyes

Eyes with ICG Done	Affected eyes n=14	
ICG findings	N	%
• Polyps	10	71.4
• Plaque	0	0.0
• No abnormality	4	28.6

5.8 DIAGNOSIS

Table 5.8.1 Diagnosis

Diagnosis	Affected Eye N=83	
	N	%
Early AMD	14	15.91
Intermediate AMD	9	10.23
Advanced AMD: Geographical Atrophy	7	7.95
Advanced AMD: Disciform Scar	21	23.86
Polyopoidal choroidal vasculopathy(PCV)	12	13.64
Choroidal Neurovascularization(CNV):Active	15	17.05
Choroidal Neurovascularization(CNV): Treated	3	3.41
Others	7	7.95
Total *	88	100.00

The total exceeds 83, as there are eyes with more than one diagnosis

Table 5.8.2 Distribution of diagnosis of affected eyes, by age

Age group	40-60		61-80		>80		All age group	
Diagnosis	No.	%	No.	%	No.	%	No.	%
Early AMD	5	21.7	9	15.8	0	0	14	15.9
Intermediate AMD	2	8.7	6	10.5	1	12.5	9	10.2
Advanced AMD: Geographical Atrophy	1	4.3	5	8.8	1	12.5	7	8
Advanced AMD: Disciform Scar	1	4.3	17	29.8	3	37.5	21	23.9
Polyopoidal choroidal vasculopathy(PCV)	6	26.1	5	8.8	1	12.5	12	13.6
Choroidal Neurovascularization (CNV):Active	4	17.4	10	17.5	1	12.5	15	17
Choroidal Neurovascularization (CNV): Treated	1	4.3	2	3.5	0	0	3	3.4
Others	3	13	3	5.3	1	12.5	7	8
Total	23	100	57	100	8	100	88	100

Table 5.8.3 Risk factors by diagnosis

DIAGNOSIS	Affected eyes Proportion with Risk factor															
	DM		HPT		Past Stroke		IHD		Hypercho-lesterolemia		Smoking		Cataract Surgery		Myopia	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Early AMD	3	14.3	3	8.1	0	0	0	0	0	0	0	0.0	0	0	1	14.3
Intermediate AMD	1	4.8	7	18.9	0	0	1	20	3	30	6	23.1	0	0	1	14.3
Advanced AMD: Geographical Atrophy	3	14.3	3	8.1	0	0	0	0	1	10	3	11.5	0	0	0	0.0
Advanced AMD: Disciform Scar	2	9.5	9	24.3	0	0	1	20	3	30	7	26.9	0	0	3	42.9
Polyopoidal choroidal vasculopathy (PCV)	3	14.3	7	18.9	1	100	1	20	0	0	3	11.5	0	0	0	0.0
Choroidal Neurovascularization (CNV):Active	7	33.3	4	10.8	0	0	2	40	3	30	5	19.2	0	0	0	0.0
Choroidal Neurovascularization (CNV): Treated	1	4.8	1	2.7	0	0	0	0	0	0	1	3.8	1	100	0	0.0
Others	1	4.8	3	8.1	0	0	0	0	0	0	1	3.8	0	0	2	28.6
Total	21	100	37	100	1	100	5	100	10	100	26	100	1	100	7	100

Table 5.8.4 Diagnosis based on OCT findings

DIAGNOSIS	Affected eyes OCT findings					
	Sub retinal fluid		Pigment Epithelial detachment		Others	
	N	%	N	%	N	%
Early AMD	0	0.0	0	0.0	5	27.8
Intermediate AMD	2	8.3	6	22.2	1	5.6
Advanced AMD: Geographical Atrophy	0	0.0	1	3.7	3	16.7
Advanced AMD: Disciform Scar	4	16.7	6	22.2	6	33.3
Polyopoidal choroidal vasculopathy (PCV)	7	29.2	5	18.5	0	0.0
Choroidal Neurovascularization (CNV):Active	10	41.7	8	29.6	0	0.0
Choroidal Neurovascularization (CNV): Treated	0	0.0	0	0.0	2	11.1
Others	1	4.2	1	3.7	1	5.6
Total	24	100	27	100.0	18	100

5.9 TREATMENTS

Table 5.9.1 Treatment

Type of treatment	Affected Eye n= 83	
	N	%
No treatment given	54	65.1
Treatment given	28	33.7
Missing	1	1.2
Type of treatment	n=28	
PDT	7	25.0
Anti VEGF	10	35.7
PDT+ Anti VEGF	2	7.1
Intravitral triamcinolone	0	0.0
Argon Laser	4	14.3
Others	5	17.9

Table 5.9.2 Treatment in affected eyes, by age

Age Group	40-49		50-59		60-69		70-79		80-89	
Type of treatment	No	%	No	%	No	No	%	No	%	No
PDT	6	66.7	7	41.2	24	61.5	13	46.4	4	50
Anti VEGF	2	22.2	5	29.4	10	25.6	8	28.6	3	37.5
PDT+ Anti VEGF	1	11.1	3	17.6	2	5.1	1	3.6	0	0
Intra vitral triamcinolone	0	0.0	2	11.8	2	5.1	5	17.9	1	12.5
Argon Laser	0	0.0	0	0.0	1	2.6	1	3.6	0	0
Others	0	0.0	0	0.0	0	0.0	0	0.0	0	0
Total	9	100.0	17	100.0	39	100.0	28	100.0	8	100

Table 5.9.2 Treatment by age

Type of treatment	Right Age group(in yrs)													
	< 40		40-49		50-59		60-69		70-79		80-89		>89	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
PDT	0	0	2	66.7	4	66.7	14	87.5	4	44.4	2	66.7	0	0
Anti VEGF	0	0	1	33.3	2	33.3	2	12.5	5	55.6	1	33.3	0	0
PDT+ Anti VEGF	0	0	1	33.3	1	16.7	1	6.3	1	11.1	0	0	0	0
Intra vitral triamcinolone	0	0	0	0	1	16.7	1	6.3	2	22.2	0	0	0	0
Argon Laser	0	0	0	0	0	0	0	0	1	11.1	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Type of treatment	Left Age group(in yrs)													
	< 40		40-49		50-59		60-69		70-79		80-89		>89	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
PDT	0	0	4	80	3	50	10	55.6	9	75	2	50	0	0
Anti VEGF	0	0	1	20	3	50	8	44.4	3	25	2	50	0	0
PDT+ Anti VEGF	0	0	0	0	2	33.3	1	5.6	0	0	0	0	0	0
Intra vitral triamcinolone	0	0	0	0	1	16.7	1	5.6	3	25	1	25	0	0
Argon Laser	0	0	0	0	0	0	1	5.6	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Chapter 6

Retinoblastoma Registry

Contributing Editor
Dr Jamalia Rahmat

CHAPTER 6 RETINOBLASTOMA REGISTRY

The Retinoblastoma (RB) registry was introduced in November 2008. It started with a retrospective data collection of retinoblastoma patients seen in Hospital Kuala Lumpur, a tertiary referral centre for retinoblastoma from 2005 till 2008.

6.1 STOCK AND FLOW

Among the 24 patients registered, 12 were diagnosed in 2007.

Table 6.1 Stock and flow

Year	No. of confirmed Retinoblastoma Cases	
	No.	%
2005	2	50
2006	5	45.5
2007	12	92.3
2008	5	83.3

6.2 PATIENTS DEMOGRAPHY

The mean age at presentation was 2.19 years. The youngest age at presentation was 1 month and the oldest was 5.5 years. About half (45.8%) of these patients were in the age group of 13 to 24 months. There were more boys (70.8%) than girls affected, and the majority were of Malay ethnicity (62.5%), followed by Chinese (12.5%) and Indians (8.3%).

Table 6.2(a) Distribution of patients by age

Age, years	N=24	
Mean	2.2	
SD	1.4	
Median	1.8	
Minimum	0.08	
Maximum	5.5	
Age group, years	No.	%
<12months	3	12.5
13months - 24months	11	45.8
25months – 36months	4	16.7
37months – 48months	4	16.7
49months – 60months	1	4.2
> 60months	1	4.2

Table 6.2(b) Distribution of patients by gender

Gender	No	%
Male	17	70.83
Female	7	29.17

Table 6.3c Distribution of patients by ethnicity

Ethnicity	No	%
Malay	15	62.5
Chinese	3	12.5
Indian	2	8.3
Orang Asli	1	4.2
Melanau	0	0
Kadazan/ Murut/ Bajau	0	0
Iban	0	0
Bidayuh	0	0
Others	3	12.5

6.3 OCULAR HISTORY AND PRESENTATION

The most common feature at presentation was leukocoria. Majority (30.4%) presented between 13 to 24 months of age and 73.9% with 7 to 12 months of history.

Table 6.3.1 Clinical presentation

Presentation	Number	%
Leukocoria	22	91.7
Strabismus	2	8.3
Proptosis	3	12.5
Others	2	8.3

Table 6.3.2 Age of onset

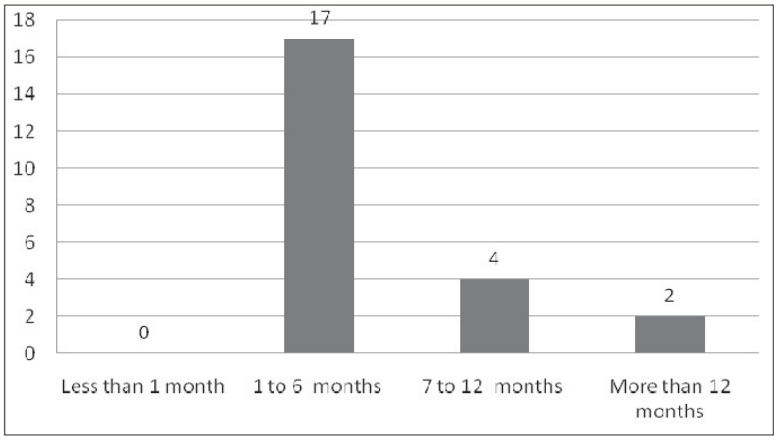
	Months (N=23)	
Min	1	
Max	53	
Mean	19.35	
	No	**%**
Less than 6 months	4	17.4
6 to 12 months	5	21.7
13 to 24 months	7	30.4
24 to 36 months	4	17.4
37 to 48 months	2	8.7
More than 48 months	1	4.3

The mean duration of disease from onset of symptoms to presentation was 5.4 months with the majority (73.9%) within 1 to 6 months.

Table 6.3.3 Duration of disease at the time of presentation

	Months (N=23)	
Min	1	
Max	17	
Mean	5.4	
	No	**%**
Less than 1 month	0	0
1 to 6 months	17	73.9
7 to 12 months	4	17.4
More than 12 months	2	8.70

Figure 6.3.3 Duration of disease at the time of presentation



Of the 24 patients registered, five of them have both eyes affected (20.8%); thus a total of 29 eyes with retinoblastoma.

Five patients (20.8%) presented with bilateral retinoblastoma. Twelve were right eyes and 16 were left eyes.

Table 6.3.4 Eyes affected

	No	% based on total eyes affected
Right eye only	12	41.4
Left eye only	17	58.6
Total eyes affected	N=29	

All patients had no positive family history of retinoblastoma.

Table 6.3.5 Family history of RB

	No	%
Yes	0	0
No	24	100
Missing	0	0
Total patients	24	100

Most eyes were blind at presentation.

Table 6.3.6 Vision Presentation

	No	%
VA better than 6/12	1	3.4
6/18 to 3/60	7	24.1
Worse than 3/60	18	62.1
Missing	3	10.3
Total eyes	29	100.0

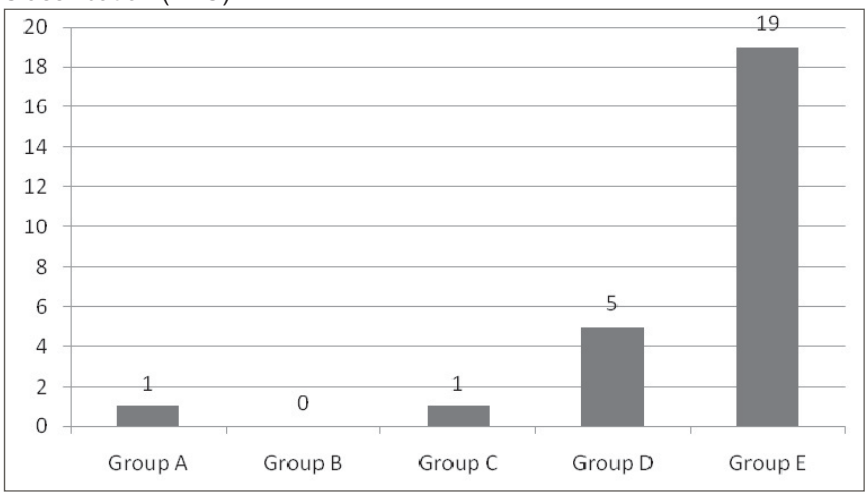
6.4 INVESTIGATION AND CLASSIFICATION

Twenty-three patients; three patients with binocular RB, had CT scan and one patient had MRI done at diagnosis. Based on the CT scan findings, all of the 26 eyes had presence of mass, 24 eyes (92.3%) had calcifications and 5 eyes (19.2%) showed evidence of extraocular extension through CT scan.
Two-thirds (65.52%) of the patients presented with Group E Retinoblastoma (based on International Intraocular Retinoblastoma Classification- IIRC)

Table 6.4 Classification of Retinoblastoma based on International Intraocular retinoblastoma Classification (IIRC)

	Right eye	% based on right eye	Left eye	% based on left eye	Total in each group	Based on total right and left eye
	No	%	No	%	No	%
Group A	1	8.3	0	0	1	3.4
Group B	0	0	0	0	0	0
Group C	1	8.3	0	0	1	3.4
Group D	4	33.3	1	5.9	5	17.2
Group E	6	50	13	76.5	19	65.5
Total eyes	12	100	17	100	29	100

Figure 6.4 Classification of Retinoblastoma based on International Intraocular retinoblastoma Classification (IIRC)



6.5 MANAGEMENT

Nineteen (76%) of patients had enucleation of the affected eye. Eleven patients (45.8%) had systemic chemotherapy. Two patients had subtenon injection of chemotherapy together with systemic chemotherapy. Focal therapy was given together with chemoreduction. There were no patients who had focal therapy only. No patient had radiotherapy.

Table 6.5 Chemotherapy by patient

	No of patient	%
Had Chemotherapy	11	45.8
If had chemotherapy		
• Systemic chemotherapy	10	90.9
• Subtenon injection	2	18.2
• Intraviteal injection	0	0
Those who had Systemic chemotherapy		
• Mean cycles given	7.6	
• Minimum cycle	5	
• Maximum cycle	9	

Comment

The RB registry is still new. At present, only patients seen in Hospital Kuala Lumpur are in the registry. We hope to include all patients seen in MOH Ophthalmology departments into the registry.

Chapter 7

Ophthalmology Service Census

Contributing Editors

Dr Mariam Ismail
Dr Goh Pik Pin
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CHAPTER 7 OPHTHALMOLOGY SERVICE CENSUS

The census were returned by hard copy form at the end of each year from 2002 to 2006. For 2007 and 2008, census data were entered monthly by the hospitals. Real time online reports both aggregated and by hospitals are available from 2007 onwards.

Table 7.1: Number of ophthalmology departments which have census return

Year	2002	2003	2004	2005	2006	2007	2008
Number of Ophthalmology departments	29	32	32	32	34	36	36

Figure 7.1: Number of out-patients visits at Ophthalmology clinics, 2002-2008

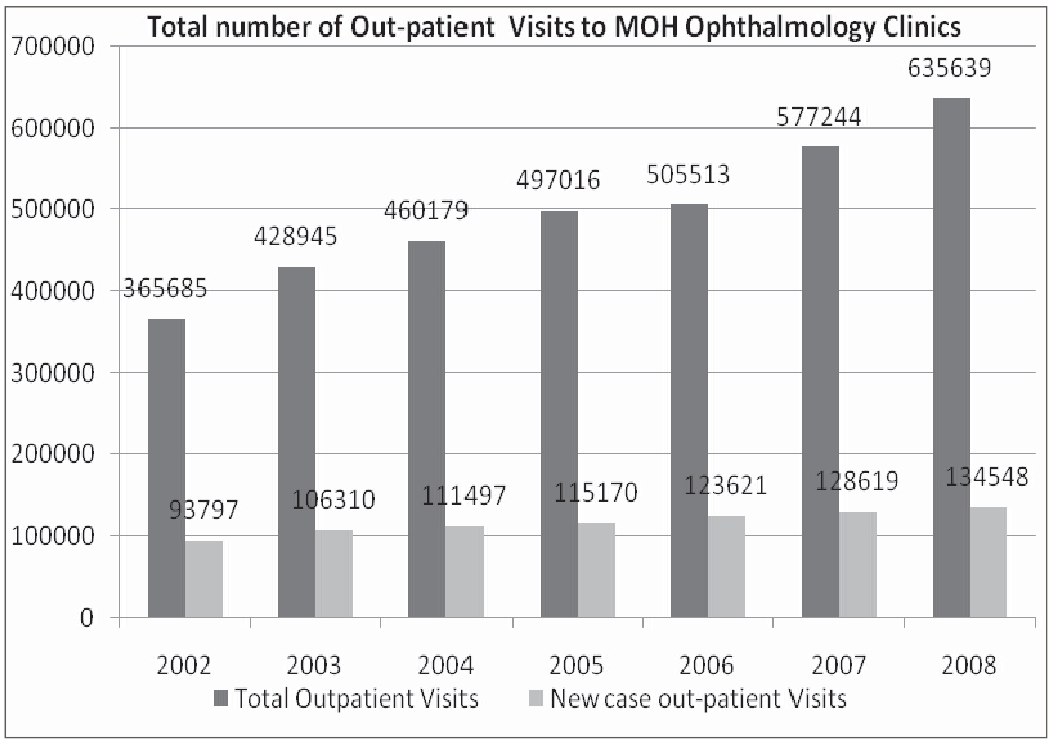


Figure 7.2: Number of in- patients admitted to eye wards, 2002-2008

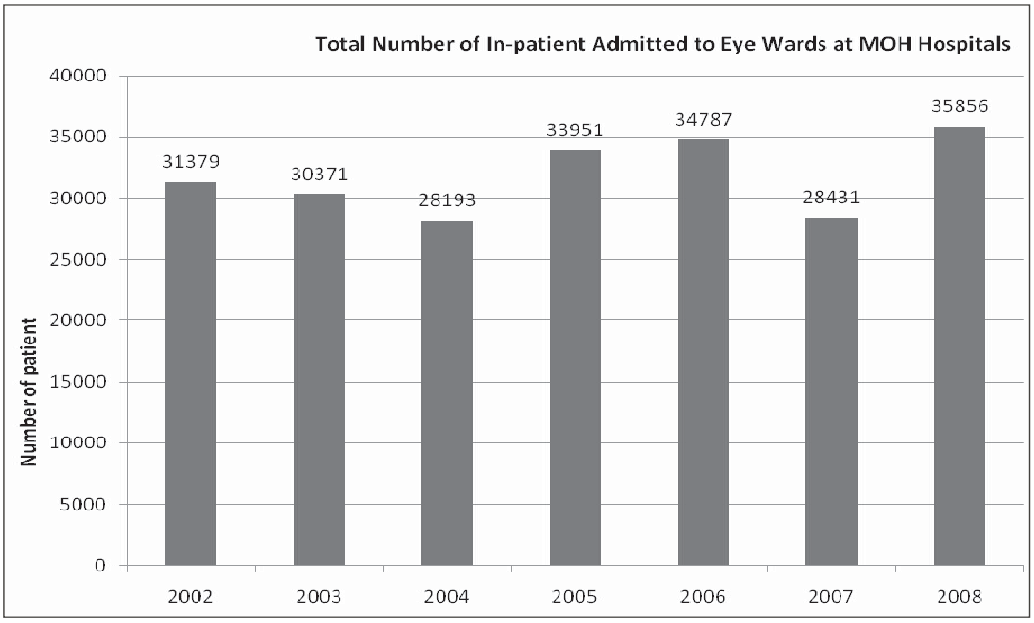
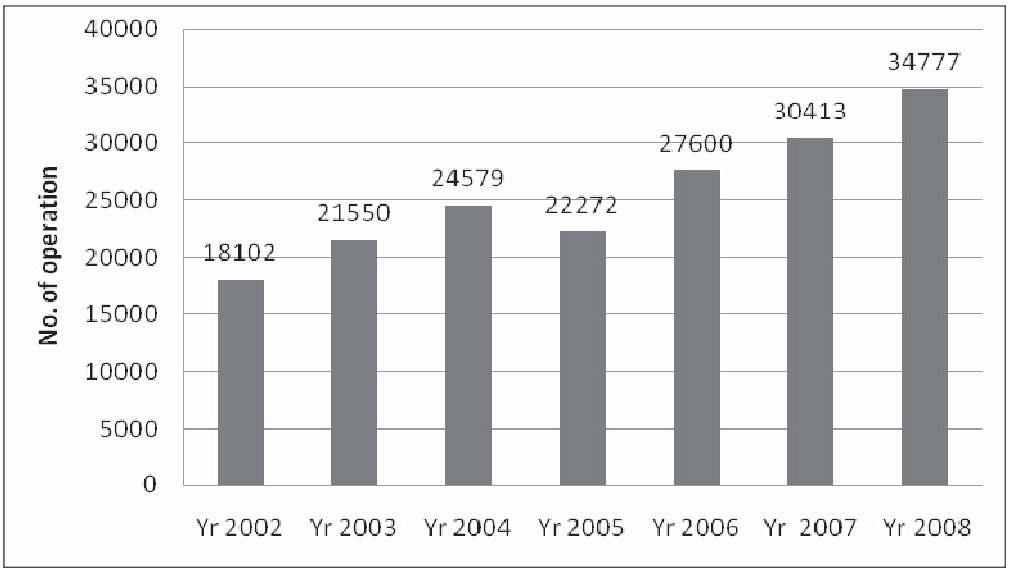


Figure 7.3: Number of ocular operation* performed, 2002-2008



*Ocular operations include surgery performed in operating theatre with grade B and C as classified in Fee Acts 1951.

Figure 7.4 Number of cataract surgeries, ECCEs and phacoemulsification performed, 2002-2008

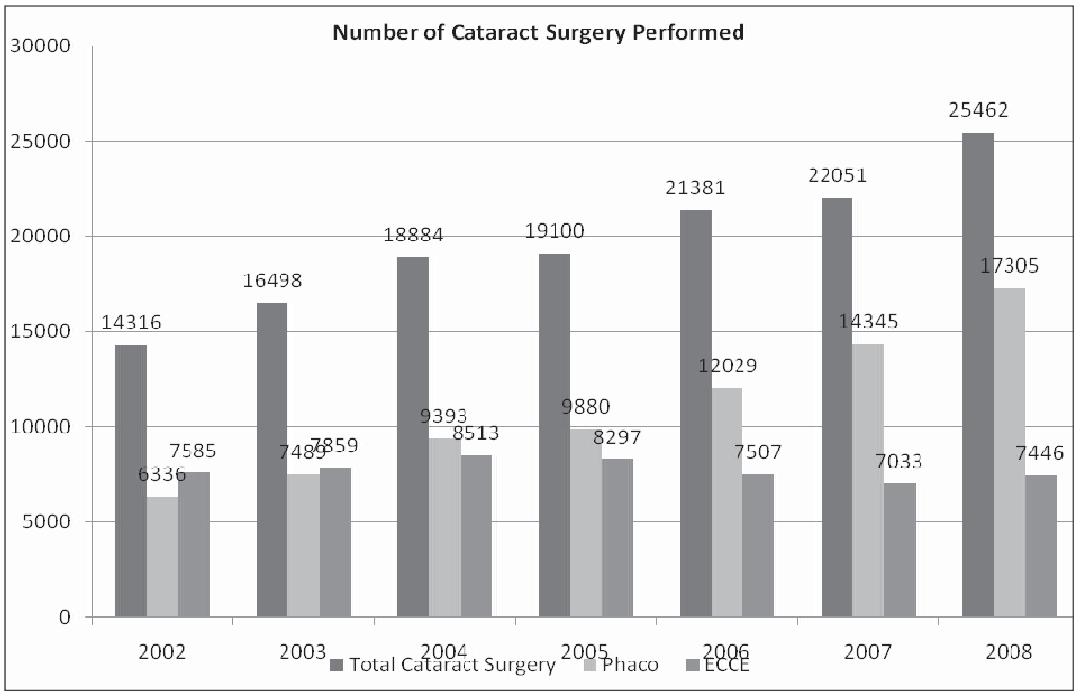


Figure 7.5: Trend of cataract surgeries performed using phacoemulsification and ECCE technique, 2002 to 2008

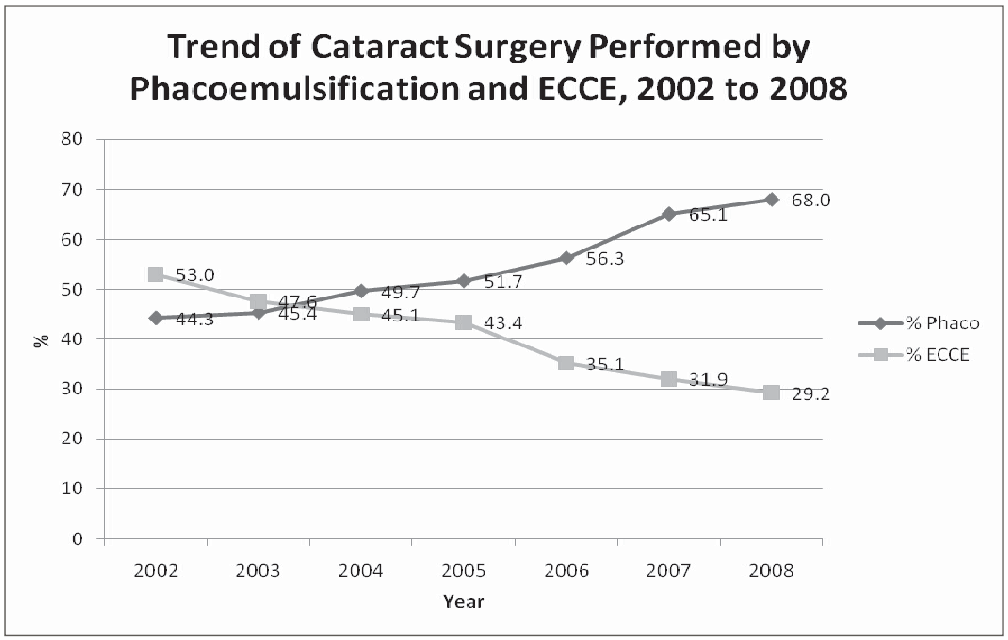


Figure 7.6: Diabetic patients seen at ophthalmology clinics, 2002-2008

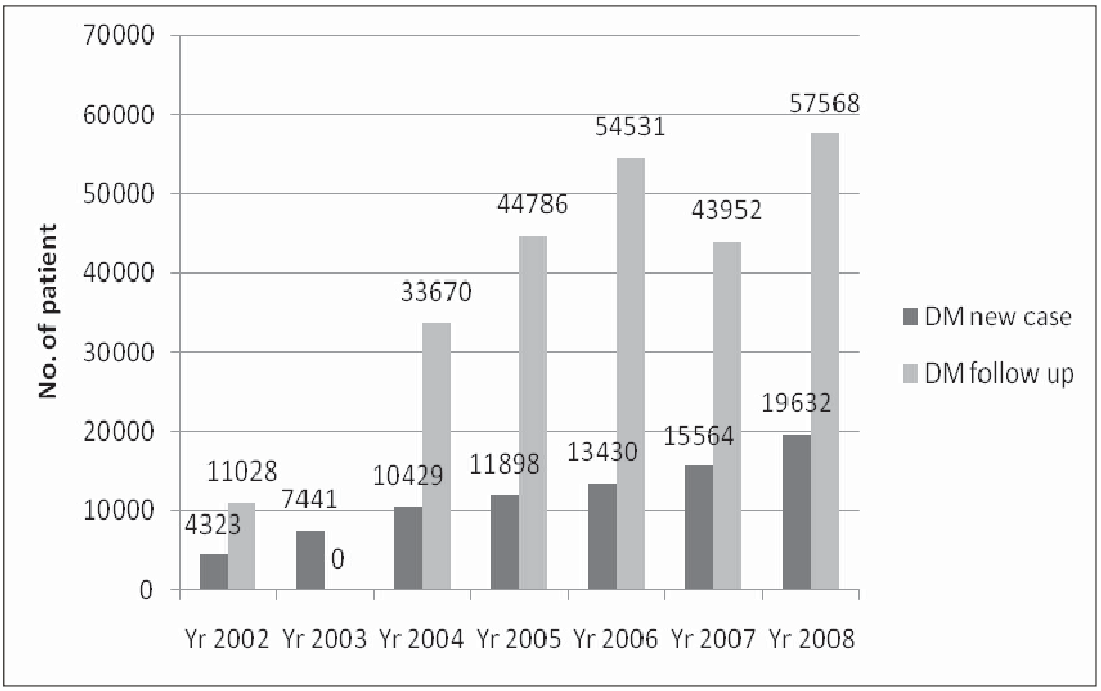


Figure 7.7: Proportion of new patients at eye clinics who came for diabetic eye screening, 2002-2008

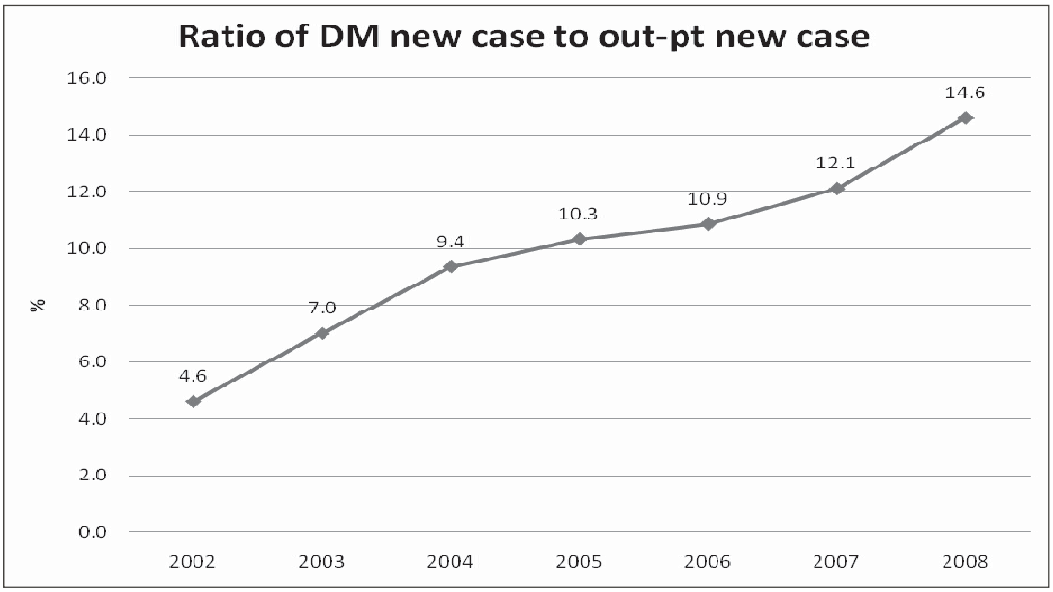


Figure 7.8: Number of vitreo-retinal surgery performed at hospitals with vitreoretinal surgeons, 2002-2008

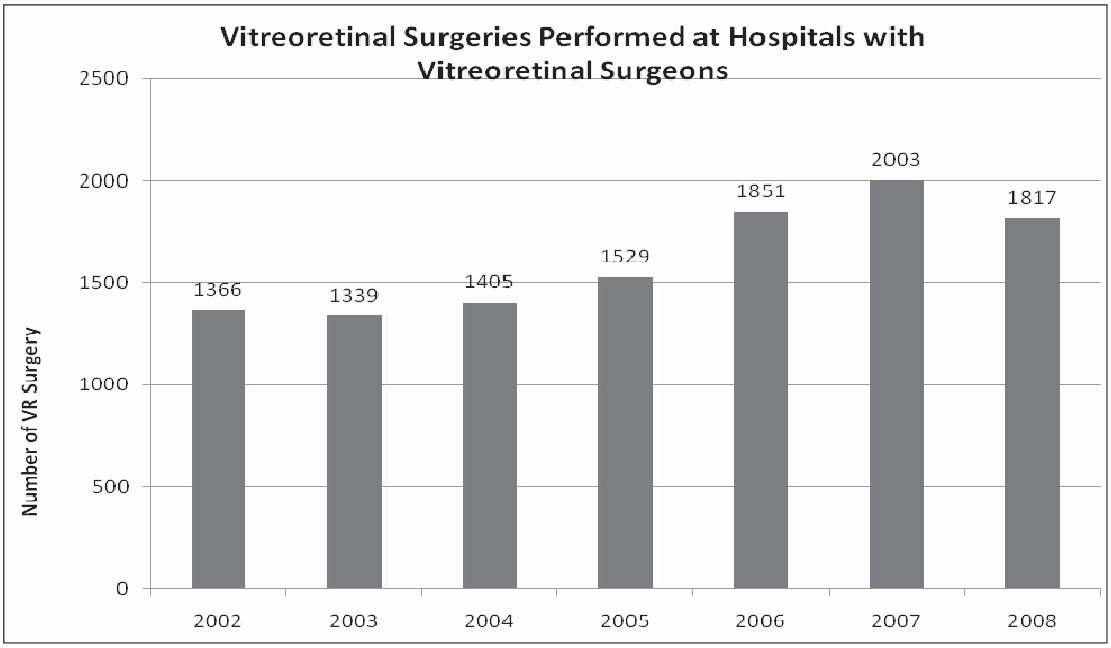


Figure 7.9: Number of refractions performed at ophthalmology clinics, 2002-2008

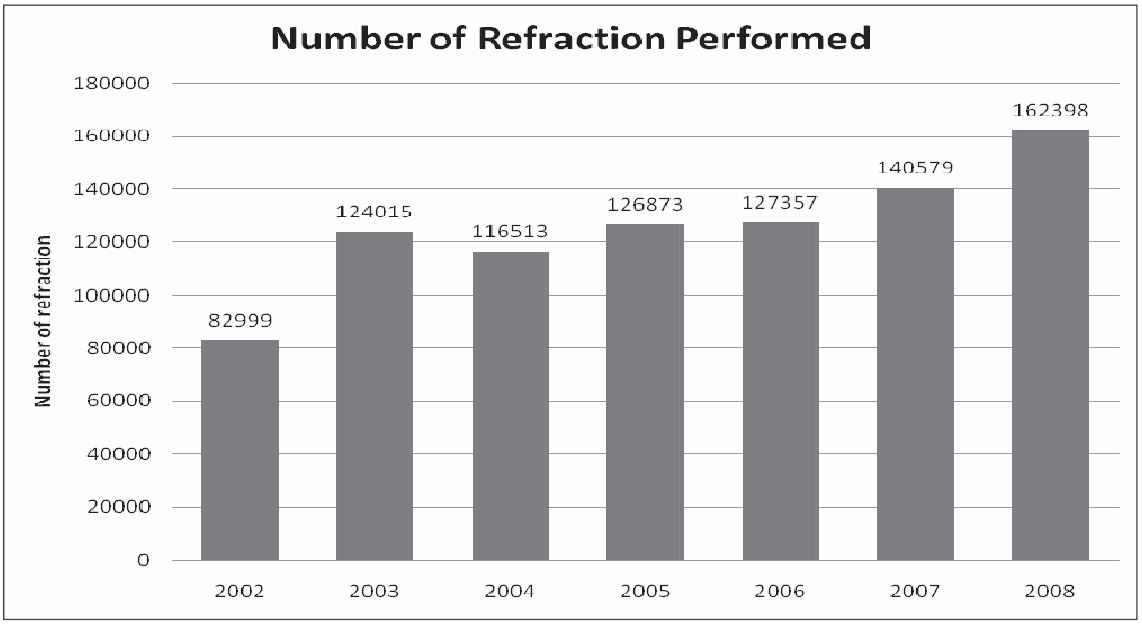


Figure 7.10: Number of patients with low vision assessments, 2002-2007

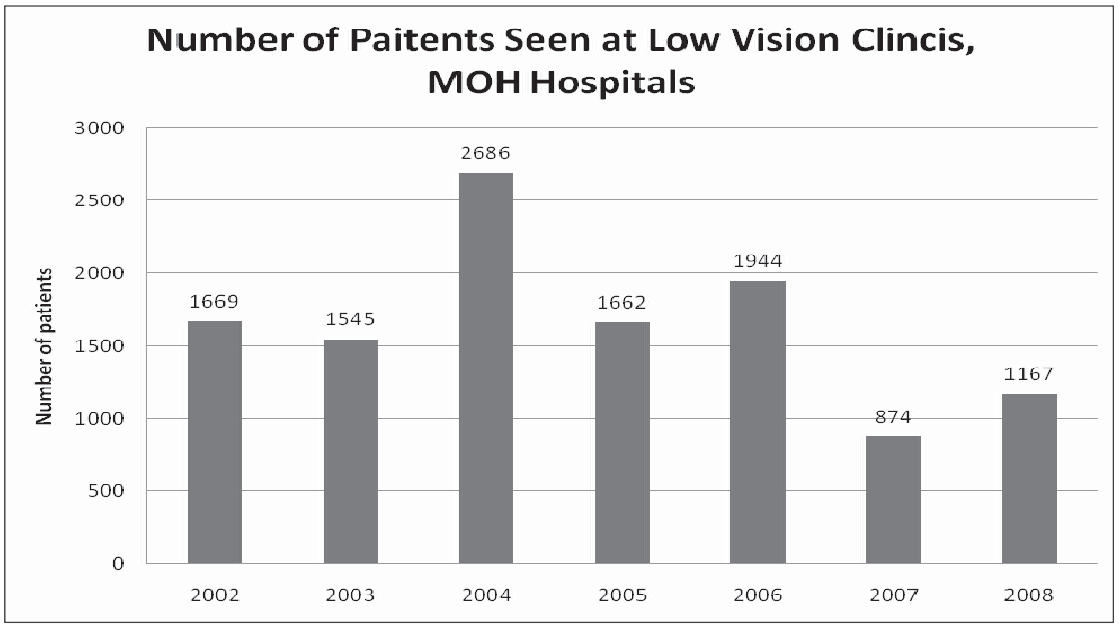


Figure 7.11: Number of premature infants screened for retinopathy of prematurity screening, 2002-2008

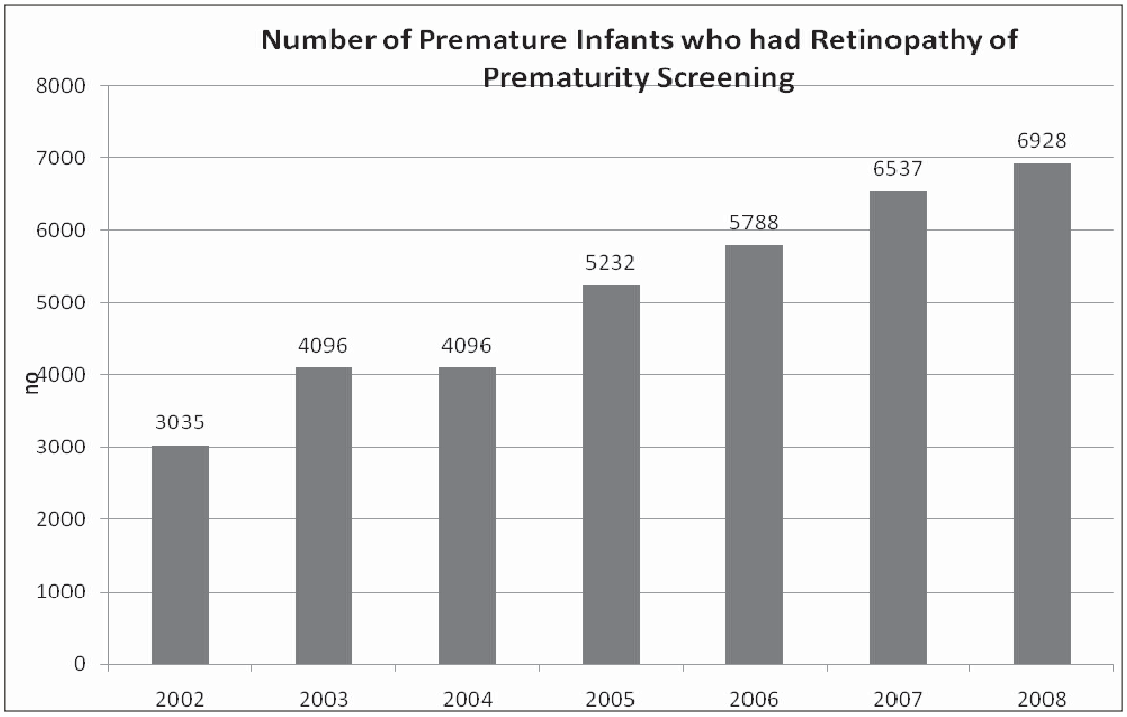
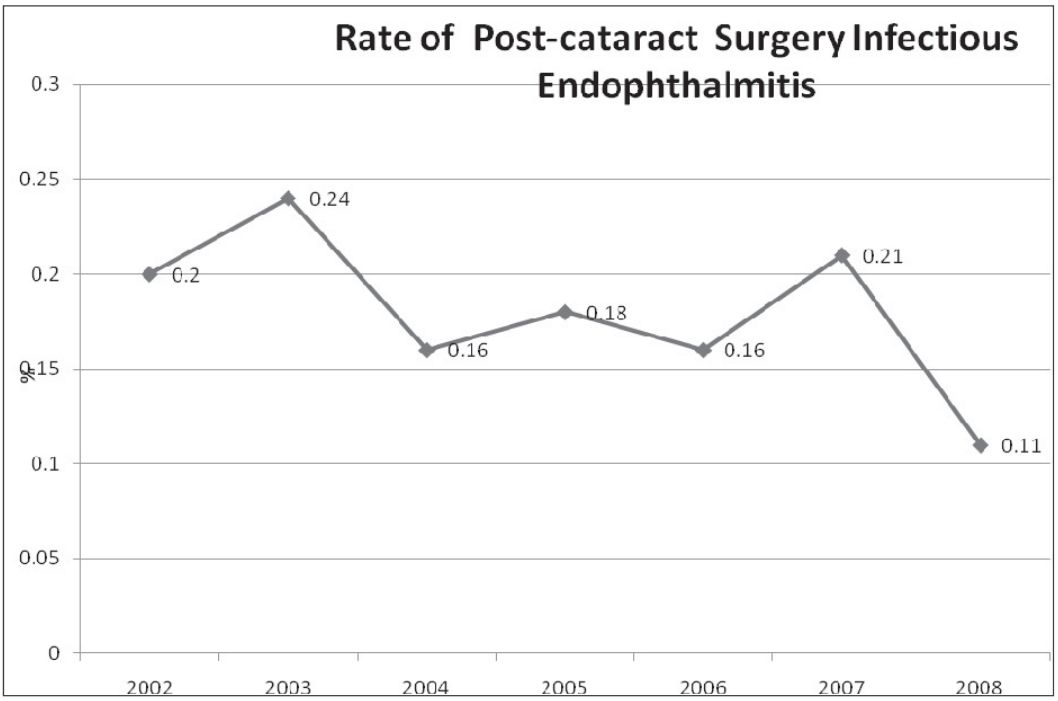


Figure 7.12: Rate of post- cataract surgery endophthalmitis, 2003-2008



Appendix:
Case Report Forms

CATARACT SURGERY REGISTRY (CSR) : PRE-CLERKING RECORD

Office use: / Centre

Instruction: This form is to be filled for patient who is going to have Cataract Surgery but excluded secondary IOL Implantation. Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◉ are provided, check (√) one box only. * Indicates compulsory field.

i) Hospital / Clinic: _____ **ii) Date :** d d m m y y

SECTION 1 : PATIENT PARTICULARS

***1. Patient Name :**					
***2. Identification Card Number :** *If MyKad/MyKid is not available, please complete the Old IC or Other ID document No.*	*MyKad / MyKid:*	- -	*Old IC:*		
	Other ID document No:	→	*Specify type (eg.passport, armed force ID):*		
3. Address :	Postcode :	Town / City:		State:	
***4a. Date of Birth:**	d d m m y y y y	***4b. Age at notification:** (Auto Calculated) **(in years) or (in months if <1 yr old)**		year(s)	month(s)
***5. Gender:** ◉ Male ◉ Female	**6. Ethnic Group:** ◉ Malay ◉ Indian ◉ Melanau ◉ Iban ◉ Other, specify : ◉ Chinese ◉ Orang Asli ◉ Kadazan/Murut/Bajau ◉ Bidayuh _____				

SECTION 2: MEDICAL HISTORY

(check ☑ one box as appropriate)

*1. Surgery On:

◉ First eye
◉ Second eye →

Date of first eye surgery: _____

Intra-op complications: ◉ Yes ◉ No

2. Past Ocular Surgery of the Eye to be operated

☐ None
☐ Vitreoretinal Surgery
☐ Penetrating Keratoplasty
☐ Filtering Surgery
☐ Pterygium Excision
☐ Other, specify: _____

3. Cause Of Cataract

◉ Primary **OR** ◉ Secondary

a) If primary:
◉ Senile/age related
◉ Congenital
◉ Developmental
◉ Other, _____

b) If Secondary:
◉ Trauma
◉ Drug Induced
◉ Surgery Induced
◉ Other, _____

*4. Ocular Comorbidity of the Eye to be operated

(check ☑ one or more boxes below if present) ☐ **None**

a) ANTERIOR SEGMENT:
☐ Pterygium involving the cornea
☐ Corneal Opacity
☐ Glaucoma
☐ Chronic Uveitis
☐ Pseudoexfoliation

Lens Related Complication
☐ Phacomorphic
☐ Phacolytic
☐ Subluxated / Dislocated

b) MISCELLANEOUS:
☐ Amblyopia
☐ Significant previous eye trauma
☐ Pre-existing non glaucoma field defect (eg. CVA)

c) POSTERIOR SEGMENT:

Diabetic Retinopathy
☐ Non Proliferative Diabetic Retinopathy
☐ Proliferative Diabetic Retinopathy
☐ Maculopathy
☐ Vitreous haemorrhage

☐ ARMD
☐ Other macular disease (includes hole or scar)
☐ Optic nerve disease, any type
☐ Retinal detachment
☐ Cannot be assessed

☐ Other ocular comorbidity, specify: _____

5. Systemic Comorbidity

(check ☑ one or more boxes below if present)

☐ None
☐ Hypertension
☐ Diabetes Mellitus
☐ Ischaemic Heart Disease
☐ Other, specify: _____
☐ Renal Failure
☐ Cerebrovascular accident
☐ COAD / Asthma

SECTION 3: PREOPERATIVE VISUAL ACUITY MEASUREMENT

Vision	a) Right	b) Left
***Unaided :**		
With glasses / Pin Hole :		
Refracted :		
Refraction :	**Sp:** ◉ + ◉ - .	**Sp:** ◉ + ◉ - .
	Cy: - .	**Cy:** - .
	Axis:	**Axis:**

SECTION 4: SURGICAL PLAN *(Do not need to enter into NED)*

1. Date of admission :	d d m m y y	**2. Date of Operation:**	d d m m y y	
3. Operation :	**Eye**	**Type**	**Anaesthesia**	**Team / doctor**
	◉ Right ◉ Left			
4. IOL details :	**Power**	**A-Constant**		**Brand**
5. Pre-op Instructions :				

SECTION 5: PLANNED REFRACTIVE POWER FOR OPERATED EYE

Planned refractive power (in Diopter, with + or – sign)
(It is the value next to the selected IOL power printed on A Scan and in most cases within -0.5 to 0)

◉ + ◉ - . .

CATARACT SURGERY REGISTRY (CSR) : OPERATIVE RECORD

Instruction: Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◉ are provided, check (√) one box only. * indicates compulsory field.

Office use: ____ / ____
Centre: ____

i) Hospital / Clinic : _____

ii) Patient Name _____

iii) Identification Card Number :

MyKad / MyKid: ☐☐☐☐☐☐ - ☐☐ - ☐☐☐☐ *Old IC:* _____

Other ID document No: _____ → *Specify type (eg.passport, armed force ID):* _____

If MyKad/MyKid is not available, please complete the Old IC or Other ID document No.

SECTION 1 : OPERATIVE DATA

1a. Surgeon status: ◉ Specialist ◉ Gazetting specialist ◉ Medical officer

***1b. Name of Surgeon:** _____

2. Type of Admission: ◉ Day Care ◉ Not Day Care

***3. Date Of Cataract Operation(dd/mm/yy):** ____ | ____ | ____

4a.Time: Start: _____ (24 hours)

End: _____ (24 hours)

4b. Duration of cataract operation: auto calculated

5. SURGERY

***a) Operated Eye:**

◉ Right
◉ Left

***b) Type:**

◉ Phaco
◉ ECCE
◉ Phaco converted to ECCE
◉ ICCE
◉ Lens aspiration
◉ Other, specify
_____

c) Combined:

(check ☑ one or more boxes below if perform)

☐ Pterygium surgery
☐ Filtering surgery
☐ Vitreo-retinal surgery
☐ Penetrating Keratoplasty
☐ Other, specify:
_____
_____

6. ANAESTHESIA

a) Type of Anaesthesia:

◉ General ◉ Local

⇓ **If local**

(check ☑ one or more boxes below)

(i)Type:

☐ Retrobulbar
☐ Peribulbar
☐ Subtenon
☐ Subconjunctival
☐ Facial block
☐ Topical
☐ Intracameral

(ii) Type of sedation:

☐ None
☐ Oral
☐ Intravenous
☐ Intramuscular

7. IOL

***a) IOL:**

If Yes ->
◉ Posterior chamber IOL
◉ Anterior chamber IOL
◉ Scleral fixated PCIOL

If No ->
◉ IOL planned, but not implanted
◉ No IOL was planned or implanted
◉ Other, specify:
_____
_____

b) Material:

◉ PMMA
◉ Silicone
◉ Acrylic → ☐ Hydrophobic ☐ Hydrophilic
◉ Other, specify: _____
_____

c) Type:

◉ Foldable
◉ Non-Foldable

*8. Intra-Operative Complications *(check ☑ one or more boxes below if present)*

☐ **None**
☐ **Posterior capsule rupture**
☐ **Vitreous Loss**
☐ **Zonular dehiscence**
☐ **Drop nucleus**
☐ **Suprachoroidal haemorrhage**
☐ **Central corneal oedema**
☐ **Other, specify:** _____
_____

CATARACT SURGERY REGISTRY (CSR):
CATARACT SURGERY OUTCOMES THROUGH 12 WEEKS POST-OP

Instruction: Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◎ are provided, check (√) one box only. * indicates compulsory field.

Office use: / Centre:

i) Hospital / Clinic : _____

ii) Patient Name _____

iii) Identification Card Number : *MyKad / MyKid:* ☐☐☐☐☐☐ - ☐☐ - ☐☐☐☐ *Old IC:* _____

Other ID document No: _____ → *Specify type (eg.passport, armed force ID):* _____

If MyKad/MyKid is not available, please complete the Old IC or Other ID document No.

iv) Date of outcome notification (dd/mm/yy) : ☐☐ ☐☐ ☐☐

v) Date of Cataract Operation (dd//mm/yy) : ☐☐ auto ☐☐

SECTION 1 : POST-OP COMPLICATIONS

(check ☑ if the following complication are noted during the first 12 weeks post-operative period)

a) ☐ **None**

b) ☐ **Infective endophthalmitis**

(If Yes) ↓

Date of Diagnosis (dd/mm/yy): ☐☐ ☐☐ ☐☐

c) ☐ **Unplanned Return To OT**

(If Yes) ↓

Reasons	Check ☑ one or more boxes below	Date (dd/mm/yy)
a) Iris prolapse	☐	☐☐ ☐☐ ☐☐
b) Wound dehiscence	☐	☐☐ ☐☐ ☐☐
c) High IOP	☐	☐☐ ☐☐ ☐☐
d) IOL related	☐	☐☐ ☐☐ ☐☐
e) Infective endophthalmitis	☐	☐☐ ☐☐ ☐☐
f) Other, specify:	☐	☐☐ ☐☐ ☐☐

SECTION 2 : POST-OP VISUAL ACUITY MEASUREMENT

(Last recorded visual acuity within 12 weeks post-op period operated eye only)

a. Post Operative Period	b. UNAIDED VISION		c. WITH GLASSES/ PIN HOLE		d. REFRACTED VISION (Record of refractive power in diopter is mandatory for operated eye (right/left), if refraction is performed)					
	(i) Right	(ii) Left	(i) Right	(ii) Left	(i) Right			(ii) Left		
					Sp	Cy	Axis	Sp	Cy	Axis
Date: ☐☐ ☐☐ ☐☐ dd mm yy **Post-op** ☐☐ **weeks** (auto calculated)					◎ + / ◎ - ☐☐.☐☐	- ☐☐.☐☐	☐☐☐	◎ + / ◎ - ☐☐.☐☐	- ☐☐.☐☐	☐☐☐

e. No record of post-operative visual acuity ☐ → **Reason for no post-op visual acuity record**

- ◎ lost to follow-up
- ◎ discharged by doctor
- ◎ unable to take vision
- ◎ others, specify: _____

f. Factor if post-op refracted VA worse than 6/12 (for operated eye only)

(check ☑ one or more boxes below if present)

- ☐ **High astigmatism**
- ☐ **Posterior capsular opacity**
- ☐ **Cystoid macular edema**
- ☐ **Infective endophthalmitis**
- ☐ **Cornea decompensation**
- ☐ **IOL decentration / dislocation**
- ☐ **Retinal detachment**
- ☐ **Preexisting ocular comorbidity, state what:** _____
- ☐ **Other, specify:** _____

NATIONAL EYE DATABASE (NED)

Office use: / Centre:

MONTHLY OPHTHALMOLOGY SERVICE CENSUS , MOH

Instruction : Please complete the census form by end of each month.

1. Hospital :

2. Month / Year : / **Date(dd/mm/yy):**

Section 1 : Outpatient

1. Total Number of Outpatients :	
2.Total Number of New Cases :	
3. Total Number of Follow Up Cases :	
4. Ratio of New Cases vs. Follow Up Cases (auto calculate) : ((3) / (2)) 1: (3/2)	1 :
5. Total Number of Children Screened for ROP :	
6. Total Number of Specialists :	
7. Ratio of Specialist to Outpatients (auto calculate): ((1) / (6)) 1: (1/6)	1 :

Section 2 : Inpatient

1. Total Number of Inpatients :	
2. Total Number of Emergency Admission :	
3. Total Number of Elective Admission (auto calculate): (1) - (2)	

Section 3 : Operation

1. Total Number of Operations (Category B and C as in Akta Fi 1951) :	
2. Total Number of Vitreoretinal Surgery :	
3. Total Number of Corneal Transplant :	
4. Total Number of Glaucoma Surgery :	
5. Number of Cases With Infectious Endophthalmitis Following Intraocular Surgery :	
6. Number of Intraocular Surgeries (excluding surgery for penetrating injury):	
7. Percent of post-operative infectious endophthalmitis (auto calculate):((5)/(6)*100%)	

Section 4 : Cataract Service

1. Total Number of Cataract Surgery :	
2. Total Number of Phacoemulsification :	
3. Total Number of ECCE :	
4. Total Number of Lens Aspiration :	
5. Number of Cataract Surgery in Adults :	
6. Number of Cataract Surgery in Adults Performed as Day Care Surgery :	
7. Percentage of Day Care Cataract Surgery in Adult (auto calculate): ((6) / (5)*100)	
8. Waiting Time for Cataract Surgery :	week
9. Total Number of Cataract Surgeons :	
10. Ratio of Cataract Surgeon to Number of Cataract Surgery (auto calculate): ((1)/(9)) 1:(1/9)	1 :

Section 5 : Diabetic Service

1. Total Number of New Diabetic Cases Referred :	
2. Total Number of Diabetic Follow Up cases :	

Section 6 : Glaucoma Service

1. Total Number of New Glaucoma Cases Seen :	
2. Total Number of Follow Up Glaucoma Cases Seen:	
3. Amount of Glaucoma Drug Prescribed (end of year only) RM	
4. Total Amount of Ophthalmic Drug Budget : (end of year only) RM	
5. Percentage of Glaucoma Drug Prescribed: (auto calculate): ((3) / (4) * 100) (end of year only)	

(SECTION 7- SECTION 11: For centres with this subspecialty service only)

Section 7 : Vitreo-Retina (VR) Service

1. Total Number of New VR Cases Seen :	
2. Total Number of Follow Up VR Cases Seen :	
3. Total Number of VR Surgery Performed :	

Section 8 : Cornea Service

1. Total Number of New Cornea Cases Seen :	
2. Total Number of Follow Up Cornea Cases Seen :	
3. Total Number of Cornea Surgery Performed :	

Section 9 : Paediatric Ophthalmology Service

1. Total Number of New Paediatric Ophthalmology Cases Seen :	
2. Total Number of Follow Up Paediatric Ophthalmology Cases Seen :	
3. Total Number of Paediatric Ophthalmology Surgery Performed :	

Section 10 : Oculoplastic Service

1. Total Number of New Oculoplasty Cases Seen :	
2. Total Number of Follow Up Oculoplasty Cases Seen :	
3. Total Number of Oculoplasty Surgery Performed :	

Section 11 : Medical Retina Service

1. Total number of New Uveitis cases :	
2. Total number of Follow Up Uveitis cases :	
3. Total number of New ARMD cases :	
4. Total number of Follow Up ARMD cases :	

Section 12 : Optometry Service

1. Total Number of Refraction :	
2. Total Number of Optometrists :	
3. Ratio of Optometrists to Number of Refractions (auto calculate) : ((1)/(2)) 1:(1/2)	1 :
4. Total Number of Patients With Low Vision (BCVA worse than 6/18 in both eyes) :	
5. Total Number of Patients With Blindness (BCVA worse than 3/60 in both eyes) :	
6. Total Number of Cases Seen at Low Vision Clinic :	
7. Total Number of Low Vision Aids Prescribed :	

Section 13 : Public Health Ophthalmology

1. Number of Primary Eye Care (PEC) Training Courses Conducted		No. of Courses	No. of Participants
a. Medical officers :			
b. Paramedic :			
c. Jururawat Masyarakat :			
2. Number of CME Session for Dept :	a. Doctors :		
	b. Paramedics :		
3. Number of Warga Tua Clinic :			
4. Number of District Visit :			
5. Number of Screening Programmes :			
6. Number of Outreach Programmes :			

NATIONAL EYE DATABASE (NED)

Office use: / Centre:

MONTHLY OPHTHALMOLOGY SERVICE CENSUS , MOH

Instruction : Please complete the census form by end of each month.

1. Hospital :

2. Month / Year : / **Date(dd/mm/yy):**

Section 1 : Outpatient

1. Total Number of Outpatients :	
2.Total Number of New Cases :	
3. Total Number of Follow Up Cases :	
4. Ratio of New Cases to Follow Up Cases (auto calculate) : ((3) / (2)) 1: (3/2)	1 :
5. Total Number of Children Screened for ROP :	
6. Total Number of Specialists :	
7. Ratio of Specialist to Outpatients (auto calculate): ((1) / (6)) 1: (1/6)	1 :

Section 2 : Inpatient

1. Total Number of Inpatients :	
2. Total Number of Emergency Admission :	
3. Total Number of Elective Admission (auto calculate): (1) - (2)	

Section 3 : Operation

1. Total Number of Operations (Category B and C as in Akta Fi 1951) :	
2. Total Number of Vitreoretinal Surgery :	
3. Total Number of Corneal Transplant :	
4. Total Number of Glaucoma Surgery :	

Section 4 : Cataract Service

1. Total Number of Cataract Surgery :	
2. Total Number of Phacoemulsification :	
3. Total Number of ECCE :	
4. Total number of ICCE :	
5. Total number of Lens Aspiration :	
6. Total number of other cataract surgery :	
7. Number of cases with Infectious Endophthalmitis following cataract surgery :	
8. Rate of post-cataract surgery infectious endophthalmitis (Auto-calculated = 7/1*100)	%

Section 5 : Diabetic Service

1. Total Number of New Diabetic Cases Referred :	
2. Total Number of Diabetic Follow Up cases :	

Section 6 : Glaucoma Service

1. Total Number of New Glaucoma Cases Seen :	
2. Total Number of Follow Up Glaucoma Cases Seen:	
3. Total Amount of Glaucoma Drug Prescribed (end of year only) RM	
4. Total Amount of Ophthalmic Drug Budget : (end of year only) RM	
5. Percentage of Glaucoma Drug Prescribed: (auto calculate): ((3) / (4) * 100) (end of year only)	

(SECTION 7- SECTION 11: For centres with this subspecialty service only)

Section 7 : Vitreo-Retina (VR) Service

1. Total Number of New VR Cases Seen :	
2. Total Number of Follow Up VR Cases Seen :	
3. Total Number of VR Surgery Performed :	

Section 8 : Cornea Service

1. Total Number of New Cornea Cases Seen :	
2. Total Number of Follow Up Cornea Cases Seen :	
3. Total Number of Cornea Surgery Performed :	

Section 9 : Paediatric Ophthalmology Service

1. Total Number of New Paediatric Ophthalmology Cases Seen :	
2. Total Number of Follow Up Paediatric Ophthalmology Cases Seen :	
3. Total Number of Paediatric Ophthalmology Surgery Performed :	

Section 10 : Oculoplastic Service

1. Total Number of New Oculoplasty Cases Seen :	
2. Total Number of Follow Up Oculoplasty Cases Seen :	
3. Total Number of Oculoplasty Surgery Performed :	

Section 11 : Medical Retina Service

1. Total number of New Uveitis cases :	
2. Total number of Follow Up Uveitis cases :	
3. Total number of New ARMD cases :	
4. Total number of Follow Up ARMD cases :	

Section 12 : Optometry Service

1. Total Number of Optometrists :	
2. Total Number of Refraction :	
3. Ratio of Optometrists to Number of Refractions (auto calculate) : ((2)/(1)) 1:(2/1)	1 :
4. Total number of contact lens patients seen :	
5. Orthoptic assessment :	
6. Other Visual Function Test : (including all types of visual fields, color vision, Hess chart, A scan, contrast sensitivity, corneal topography, HRT,GDX,OCT, diabetic eye screening, visual assessment in children and electrophysiology tests etc.)	
7. Total Number of Patients Seen at Low Vision Clinic :	
8. Total Number of Low Vision Aids Prescribed :	

Section 13 : Public Health Ophthalmology

1. Number of Primary Eye Care (PEC) Training Courses Conducted		No. of Courses	No. of Participants
	a. Medical officers :		
	b. Paramedic :		
	c. Jururawat Masyarakat :		
2. Number of CME Session for Dept :	a. Doctors :		
	b. Paramedics :		
3. Number of Warga Tua Clinic :			
4. Number of District Visit :			
5. Number of Screening Programmes :			
6. Number of Outreach Programmes :			

CONTACT LENS RELATED CORNEAL ULCER SURVEILLANCE

Office use: / Centre:

Instruction: Please notify all contact lens related corneal ulcer at the time patient is diagnosed by filling in or enter to eNED. Please complete Section 3 and Section 4 by 3 months.
Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◉ are provided, check (√) one box only. * indicates compulsory field.

***i) Hospital / Clinic:** _____ ***ii) Dr in charge :** _____

SECTION 1 : DEMOGRAPHICS

***1. Patient Name :**					
***2. Identification Card Number :** *If MyKad/MyKid is not available, please complete the Old IC or Other ID document No.*	*MyKad / MyKid:*	- -	*Old IC:*		
	Other ID document No:	→	*Specify type (eg.passport, armed force ID):*		
3. Address :	Postcode :	Town / City:		State:	
***4a. Date of Birth:**	d d m m y y	***4b. Age at presentation:** Auto Calculated		year(s) month(s)	
***5. Gender:**	◉ Male ◉ Female	**6. Ethnic:**	◉ Malay ◉ Indian ◉ Melanau ◉ Iban ◉ Other, specify: ◉ Chinese ◉ Orang Asli ◉ Kadazan/Murut/Bajau ◉ Bidayuh		
7. Source of referral :	◉ Government OPD clinic / Klinik Kesihatan / Klinik Des ◉ General Practitioner (GP) ◉ Optometrists/ Optician ◉ Government Hospital - MO or specialist ◉ Private Hospital - MO or specialists ◉ Others, specify:				

SECTION 2 : OCULAR HISTORY

***1. Date of Presentation:**	d d m m y y	***2. Duration of Symptoms:**	*(days)*				
***3. Affected eye :**	◉ Right Eye ◉ Left Eye ◉ Both Eye						
4. Vision at Presentation :	**Right eye**				**Left eye**			
	a) Unaided:		b) With glasses / pinhole:		a) Unaided:		b) With glasses / pinhole	
5. Presumptive causative organism :	☐ Bacteria ☐ Fungus ☐ Acanthamoeba ☐ Others, specify:							
6. Laboratory investigation specimen sent :	☐ Corneal scraping ☐ Contact lens ☐ Contact lens solution ☐ PCR for fungus ☐ Not sent							
7. Type of Contact Lens :	☐ Daily Disposable ☐ Weekly Disposable ☐ 2 weekly Disposable ☐ Cosmetic coloured contact lens ☐ Extended wear ☐ Rigid gas permeable ☐ Monthly Disposable ☐ Others, specify :							
8. Brand of Contact lens :	(e.g. Pure Vision (Bausch & Lomb), Acuvue (Johnson & Johnson), Biomedic (Cooper Vision), Focus Night & Day (Ciba Vision))							
9. Wearing Pattern :	☐ Daily Wear (removes before sleep) ☐ Extended wear (sleeps with lens on)							
10. Cleaning Solution :	☐ Alcon ☐ Bausch and Lomb ☐ Allergan (AMO) ☐ Ciba Vision ☐ Opto-medic ☐ Freskon ☐ Sauflon ☐ Multisoft ☐ I-Gel ☐ Medivue ☐ Normal Saline ☐ Simvue ☐ Multimate ☐ Pharmasafe Multipurpose solution ☐ Tap Water ☐ Others, specify : ☐ Do not use because of daily wear ☐ Not known							
11. Ocular Trauma :	◉ Yes, specify: ◉ No							

SECTION 3 : CULTURE RESULTS BY 3 MONTHS AFTER PRESENTATION

1. Corneal Scraping :	☐ Negative (No growth) ☐ Bacterial, specify: ☐ Not Sent ☐ Missing data ☐ Acanthamoeba ☐ Fungal, specify: ☐ Others, specify:			
2. Contact lens :	☐ Negative (No growth) ☐ Bacterial, specify: ☐ Not Sent ☐ Missing data ☐ Acanthamoeba ☐ Fungal, specify: ☐ Others, specify:			
3. Contact lens solution :	☐ Negative (No growth) ☐ Bacterial, specify: ☐ Not Sent ☐ Missing data ☐ Acanthamoeba ☐ Fungal, specify: ☐ Others, specify:			
4. PCR :	◉ Detected, specify type of organism:	◉ Not Detected	◉ Not Sent	

SECTION 4 : OUTCOME BY 3 MONTHS AFTER PRESENTATION

1. Final Diagnosis: (based on lab results and clinical response to treatment)	☐ Bacterial, specify: ☐ Fungal, specify: ☐ Acanthamoeba ☐ Uncertain ☐ Others, specify:			
2. Vision by 3 months after presentation:	**Right eye**		**Left eye**	
	a) Unaided:	b) With glasses / pinhole:	a) Unaided:	b) With glasses / pinhole:
3. Corneal Perforation :	◉ Yes	◉ No		
4. Surgery :	☐ No ☐ Penetrating keratoplasty ☐ Eviseration ☐ Cornea Gluing ☐ Other, specify:			
5. Case Referred to other center :	◉ Yes, specify hospital:	◉ No		

DIABETIC EYE REGISTRY

Office use: / Centre:

Instruction: This data collection form is to be filled for all diabetic patients who are seen for the first time at Ophthalmology clinic, include diabetic patients who are referred for reasons other than diabetic eye screening. Exclude patients who have regular fundal examination by trained eye care providers such as optometrists, MO or opthalmologists in other centres.
Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◉ are provided, check (√) one box only. * indicates compulsory field.

***i) Hospital / Clinic** _____ ***ii) Date of notification (dd/mm/yy)** | | |

SECTION 1 : PATIENTS DEMOGRAPHY AND MEDICAL HISTORY

***1. Patient Name :**

***2. Identification Card Number :**
If MyKad/MyKid is not available, please complete the Old IC or Other ID document No.

MyKad / MyKid: - - *Old IC:*

Other ID document No: → *Specify type (eg.passport, armed force ID):*

3. Residential area : Postcode : Town / City: State:

***4a. Date of Birth:** d d m m y y

***4b. Age of notification:** Auto Calculated year(s) month(s)

***5. Gender:** ◉ Male ◉ Female

6. Ethnic Group: ◉ Malay ◉ Indian ◉ Melanau ◉ Iban ◉ Other, specify: ◉ Chinese ◉ Orang Asli ◉ Kadazan/Murut/Bajau ◉ Bidayuh

7. Source of referral : ◉ Government OPD clinic / Klinik Kesihatan / Klinik Desa ◉ General Practitioner (GP) ◉ Optometrists/ Optician ◉ Government Hospital - MO or specialist ◉ Private Hospital - MO or specialists ◉ Others, specify:

8. Type of DM : ◉ Type II ◉ Type I ◉ Pre-diabetic

9. Duration of DM : month(s) year(s)

10. Treatment : ☐ Oral Medication only ☐ Insulin only ☐ Oral medication and insulin ☐ Other, specify:

11. Systemic co-morbidity :

☐ None ☐ IHD ☐ Amputation
☐ HPT ☐ CVA ☐ Peripheral neuropathy
☐ Renal Impairment ☐ Foot ulcer
☐ Hypercholesterolemia ☐ Anemia ☐ Other, specify:

12. Risk factors :

☐ Current Smoker
☐ Pregnant → If yes, trimester: ◉ 1st ◉ 2nd ◉ 3rd

13. Ocular Co-morbidity :

☐ None ☐ Glaucoma
☐ Cataract ☐ Other, specify:

14. Has patient had fundus examination before?

◉ Yes ◉ No
→ Date of last fundal examination (mm/yy) :

SECTION 2 : OCULAR FINDINGS AND MANAGEMENT

1. Visual acuity :

	a) Right eye		b) Left eye	
	Unaided :	**With glasses/ Pin hole :**	**Unaided :**	**With glasses / Pin hole:**

***2. Fundus Finding :**

a) Right eye:
◉ No view, comments:
◉ No Diabetic Retinopathy
◉ Has Diabetic Retinopathy (DR)
→ i. Diabetic retinopathy type
- ◉ Mild non proliferative diabetic retinopathy
- ◉ Moderate non proliferative diabetic retinopathy
- ◉ Severe non proliferative diabetic retinopathy
- ◉ Proliferative diabetic retinopathy, including quiescent PDR
- ◉ Advanced diabetes eye disease
  - → ☐ Persistent vitreous haemorrhage
  - ☐ Tractional retinal detachment

ii. Maculopathy → ◉ Yes ◉ No

b) Left eye:
◉ No view, comments:
◉ No Diabetic Retinopathy
◉ Has Diabetic Retinopathy (DR)
→ i. Diabetic retinopathy type
- ◉ Mild non proliferative diabetic retinopathy
- ◉ Moderate non proliferative diabetic retinopathy
- ◉ Severe non proliferative diabetic retinopathy
- ◉ Proliferative diabetic retinopathy, including quiescent PDR
- ◉ Advanced diabetes eye disease
  - → ☐ Persistent vitreous haemorrhage
  - ☐ Tractional retinal detachment

ii. Maculopathy → ◉ Yes ◉ No

3. Fundus photograph taken : *(one or both eyes)* ◉ Yes ◉ No

4. Plan :

☐ Routine follow up as scheduled (patient do not need treatment) ☐ Need further assessment such as FFA
☐ Need procedures → ☐ Need laser → Type of laser : ☐ Focal laser ☐ Pan retinal photocoagulation (PRP)
☐ Need Vitreoretinal surgery ☐ Need glaucoma procedure for rubeotic glaucoma
☐ Others, state:

GLAUCOMA REGISTRY

Office use: / Centre:

Instruction: This form is to be filled for patient who has glaucoma including glaucoma suspect. Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◯ are provided, check (√) one box only.

i) Hospital : _____ **ii) Date of notification (dd/mm/yy):** | | | | **iii) Type of case:** ◯ New ◯ Follow-up

SECTION 1 : PATIENT PARTICULARS

1. Name of Patient : *

2. Identification Card Number : *
If MyKad/MyKid is not available, please complete the Old IC or Other ID document

MyKad / MyKid: | | | | | | | - | | | - | | | | |

Other ID : *(specify) (eg. old IC, passport, armed force, hospital registration No.)* _____ *No. :* _____

3. Address : Postcode: | | | | | Town / City: _____ State: _____

4a. Date of Birth: * d d m m y y

4b. Age at notification: * (Auto Calculated) | | year(s) | | month(s)

5. Gender: * ◯ Male ◯ Female

6. Ethnic Group: * ◯ Malay ◯ Indian ◯ Melanau ◯ Iban ◯ Other, specify : _____
◯ Chinese ◯ Orang Asli ◯ Kadazan/Murut/Bajau ◯ Bidayuh

7. Occupation: * ◯ Government employed ◯ Private employed ◯ Self employed ◯ Unemployed

SECTION 2 : ASSOCIATE FACTORS *

1. Medical History :
☐ None ☐ Hypertension ☐ Cardiac disease ☐ Vasospastic disease ☐ History of steroid therapy
☐ Diabetes ☐ Hypercholesterolemia ☐ Stroke ☐ Respiratory diseases ☐ Family history of glaucoma

SECTION 3 : OCULAR EXAMINATION *

1. Eye(s) affected: ◯ Right eye only ◯ Left eye only ◯ Both eyes

	a) OD	b) OS
2. VA:	(i) : ☐ Unobtainable (ii) Unaided : _____ (iii) With glasses/pH : _____	(i) : ☐ Unobtainable (ii) Unaided : _____ (iii) With glasses/pH : _____
3. CUP-DISC RATIO (VERTICAL) :	◯ 0.1 ◯ 0.4 ◯ 0.7 ◯ 1.0 ◯ 0.2 ◯ 0.5 ◯ 0.8 ◯ Undetermined ◯ 0.3 ◯ 0.6 ◯ 0.9 ◯ No view	◯ 0.1 ◯ 0.4 ◯ 0.7 ◯ 1.0 ◯ 0.2 ◯ 0.5 ◯ 0.8 ◯ Undetermined ◯ 0.3 ◯ 0.6 ◯ 0.9 ◯ No view

SECTION 4 : DIAGNOSIS *

1. Diagnosis :

a) OD		b) OS	
(i) Primary	**(ii) Secondary**	**(i) Primary**	**(ii) Secondary**
◯ Congenital ◯ OHT ◯ POAG ◯ PACG ◯ Glaucoma suspect ◯ PAC ◯ PAC suspect ◯ Others, specify: _____	◯ PEX ◯ PDS ◯ Rubeotic ◯ Inflammatory ◯ Posttraumatic ◯ Lens induced ◯ Steroid Induced ◯ Post Surgery ◯ Malignant ◯ ICE ◯ Mixed Type ◯ OHT ◯ Others, specify: _____	◯ Congenital ◯ OHT ◯ POAG ◯ PACG ◯ Glaucoma suspect ◯ PAC ◯ PAC suspect ◯ Others, specify: _____	◯ PEX ◯ PDS ◯ Rubeotic ◯ Inflammatory ◯ Posttraumatic ◯ Lens induced ◯ Steroid Induced ◯ Post Surgery ◯ Malignant ◯ ICE ◯ Mixed Type ◯ OHT ◯ Others, specify: _____

SECTION 5 : MANAGEMENT *

	a) OD	b) OS
1. No treatment : *(NPL or poor visual potential eye)*	◯ Yes ◯ No	◯ Yes ◯ No
2.Observation:	◯ Yes ◯ No	◯ Yes ◯ No
3. Current Medical Therapy *Note : fixed combination consider as 2 drugs*	Antiglaucoma medication (topical/systemic) : ◯ Yes ◯ No ☐ Beta-blockers ☐ Alpha-adrenergic ☐ Systemic CAIs ☐ Prostaglandins ☐ Hyperosmotic agents ☐ Topical CAIs ☐ Cholinergics ☐ Others, specify: _____	Antiglaucoma medication (topical/systemic) : ◯ Yes ◯ No ☐ Beta-blockers ☐ Alpha-adrenergic ☐ Systemic CAIs ☐ Prostaglandins ☐ Hyperosmotic agents ☐ Topical CAIs ☐ Cholinergics ☐ Others, specify: _____
4. Previous Laser Therapy	◯ Yes ◯ No ☐ Iridotomy ☐ Trabeculoplasty ☐ Endocyclodiode ☐ Iridoplasty ☐ Transcleral Cyclodiode ☐ Others, specify:	◯ Yes ◯ No ☐ Iridotomy ☐ Trabeculoplasty ☐ Endocyclodiode ☐ Iridoplasty ☐ Transcleral Cyclodiode ☐ Others, specify:
5. Previous Surgery	◯ Yes ◯ No ☐ Trabeculectomy (plain) ☐ Trabeculectomy (augmented) ☐ Drainage Device ☐ Cryotherapy ☐ Needling ☐ Surgical PI only ☐ Non Penetrating Surgery ☐ Goniotomy ☐ Trabeculotomy ☐ Others, specify _____	◯ Yes ◯ No ☐ Trabeculectomy (plain) ☐ Trabeculectomy (augmented) ☐ Drainage Device ☐ Cryotherapy ☐ Needling ☐ Surgical PI only ☐ Non Penetrating Surgery ☐ Goniotomy ☐ Trabeculotomy ☐ Others, specify _____

Examined by : ◯ Glaucoma Specialist ◯ Glaucoma Fellow ◯ Other specialist ◯ Medical Officer

TELE DIABETIC RETINOPATHY SCREENING

Office use: / Centre:

Instruction: Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◯ are provided, check (√) one box only.

* **i) Site (machine location) :** _____ * **iii) Date of fundus photography (dd/mm/yy):** ☐☐ ☐☐ ☐☐

* **ii) Site (where patient is from) :** _____

* **iv) Photo taken by :**	◯ Family Medication Specialist (FMS)	◯ Medical Assistant (MA)	◯ Jururawat Masyarakat (JM)
	◯ Doctor (Dr)	◯ Staff Nurse (SN)	◯ Radiographer (Rad)

SECTION 1 : PATIENTS DEMOGRAPHY AND MEDICAL HISTORY (to be filled by operator)

1. Patient Name : *					
2. Identification Card Number : * *If MyKad/MyKid not available, please complete the Old IC or Other ID*	*MyKad / MyKid:* ☐☐☐☐☐☐-☐☐-☐☐☐☐			*Old IC:*	
	Other ID document No:		→ *Specify type (eg.passport, armed force ID):*		
3. Age of notification: *	☐☐	**4. Gender:** ◯ Male ◯ Female	**5. Ethnic Group:**	◯ Malay ◯ Orang Asli ◯ Iban ◯ Chinese ◯ Melanau ◯ Bidayuh ◯ Indian ◯ Kadazan/Murut/Bajau ◯ Other, specify: _____	
6. Type of DM :	◯ Type II ◯ Type I		**7. Pregnancy :**	◯ Yes ◯ No	
8. Treatment :	◯ Oral Medication Only ◯ Insulin Only ◯ Oral Medication + Insulin ◯ Other, specify : _____				
9. Visual Acuity : *	**a) Right eye**		**b) Left eye**		
10. Photo Taken : *	◯ Both eyes ◯ Right eye only ◯ Left eye only →	If photo of one eye or both eyes are not taken or not saved due to poor quality, reason :	☐ No Red Reflex ☐ No View ☐ No Eyeball ☐ Other, specify: _____		

SECTION 2 : DIAGNOSIS AND MANAGEMENT PLAN (to be filled by grader)

1. Date of Grading : * (dd/mm/yy) ☐☐/☐☐/☐☐

DIAGNOSIS	MANAGEMENT PLAN
☐ Inadequate view for grading ↳ ☐ Right eye ☐ Left eye	◯ Call patient to repeat fundus photo ◯ Refer eye clinic on : **a) Date of appointment :** (dd/mm/yy) ☐☐/☐☐/☐☐ **b) Time of appointment :** ☐☐:☐☐
☐ No apparent diabetic retinopathy : ↳ ☐ Right eye ☐ Left eye	Give appointment to repeat fundus photo at KK in : ◯ One year ◯ If pregnant, every 3 months
☐ Mild non proliferative diabetic retinopathy : ↳ ☐ Right eye ☐ Left eye	Give appointment to repeat fundus photo at KK in : ◯ 9 months ◯ One year ◯ If pregnant, every 3 months
☐ Moderate non proliferative diabetic retinopathy : ↳ ☐ Right eye ☐ Left eye	Give appointment to repeat fundus photo at KK in : ◯ 6 months ◯ 9 months ◯ If pregnant, every 3 months
☐ Severe non proliferative diabetic retinopathy : ↳ ☐ Right eye ☐ Left eye ☐ Proliferative diabetic retinopathy : ↳ ☐ Right eye ☐ Left eye ☐ Advanced diabetic eye disease : ↳ ☐ Right eye ☐ Left eye ☐ Maculopathy : ↳ ☐ Right eye ☐ Left eye	**i. Refer eye clinic on :** **a) Date of appointment :** (dd/mm/yy) ☐☐/☐☐/☐☐ **b) Time of appointment :** ☐☐:☐☐ **ii. Treatment planned :** ☐ Laser ☐ Fundus Flourescein Angiography (FFA)
☐ Glaucoma suspect : ↳ ☐ Right eye ☐ Left eye ☐ Age related macular degeneration : ↳ ☐ Right eye ☐ Left eye ☐ Other fundus findings : ↳ ☐ Right eye, state : _____ ☐ Left eye, state : _____	**i. Refer eye clinic for further assessment on :** **a) Date of appointment :** (dd/mm/yy) ☐☐/☐☐/☐☐ **b) Time of appointment :** ☐☐:☐☐
☐ Vision worse the 6/12 in either eye	Refer to Optometrists for refraction

Date of referral letter faxed out: (dd/mm/yy)	☐☐/☐☐/☐☐
Patient seen at referring eye clinic	◯ Yes → **a) Date seen :** (dd/mm/yy) ☐☐/☐☐/☐☐ ◯ No

Instruction : The status is known only after the date of appointment given. Data is captured from eye clinic counter when the patients being refererd come for appointment and status to be entered to Tele DR

RETINOBLASTOMA REGISTRY

Office use: / Centre:

Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◯ are provided, check (√) one box only.

i) Hospital / Clinic: _____ **ii) Dr in charge :** _____ **iii) Date of Notification :** ☐☐ / ☐☐ / ☐☐☐☐

SECTION A : DEMOGRAPHICS

1. Patient Name : *

2. Identification Card Number : *
If MyKad/MyKid is not available, please complete the Old IC or Other ID document No.

MyKad / MyKid: ☐☐☐☐☐☐ - ☐☐ - ☐☐☐☐ Old IC:

Other ID document No: → Specify type (eg.passport, armed force ID):

3. Address : Postcode ☐☐☐☐☐ Town / City: State:

4. Contact number : Homephone: ☐☐☐ - ☐☐☐☐☐☐☐☐ H/P: ☐☐☐ - ☐☐☐☐☐☐☐☐

5. Date of Birth: * d d m m y y

6. Age at presentation: * ☐☐ year(s) ☐☐ month(s)

7. Gender: * ◯ Male ◯ Female

8. Ethnic: ◯ Malay ◯ Indian ◯ Melanau ◯ Iban ◯ Other, specify: ..... ◯ Chinese ◯ Orang Asli ◯ Kadazan/Murut/Bajau ◯ Bidayuh

SECTION B : OCULAR HISTORY AND PRESENTATION

1. Clinical presentation: ☐ Leukocoria ☐ Strabismus ☐ Proptosis ☐ Others, specify: .....

2. Age of onset: ☐☐ year(s) ☐☐ month(s)

3. Duration of disease: ☐☐ month(s)

4. Eye affected: ◯ Right ◯ Left ◯ Both

5. Family History: ◯ Yes ◯ No

6. Vision at presentation:

	Right eye	Left eye
6a. Vision:	Unaided: ☐☐☐ With glasses/pin hole: ☐☐☐	Unaided: ☐☐☐ With glasses/pin hole: ☐☐☐
6b. Unable to take vision, appear to have:	◯ Normal vision ◯ Impaired vision ◯ Blind	◯ Normal vision ◯ Impaired vision ◯ Blind

SECTION C : REFER TO TERTIARY CENTER

1. Refer to tertiary center: ◯ No ◯ Yes → **Hospital :**

SECTION D : INVESTIGATIONS & CLASSIFICATION

1. Imaging:

a) CT scan:

Right eye: ◯ No ◯ Yes → ☐ Presence of mass ☐ Presence of calcification ☐ Extraocular extension → ☐ Optic pathway ☐ Orbit and adnexa ☐ Intracranial

Left eye: ◯ No ◯ Yes → ☐ Presence of mass ☐ Presence of calcification ☐ Extraocular extension → ☐ Optic pathway ☐ Orbit and adnexa ☐ Intracranial

b) MRI:

Right eye: ◯ No ◯ Yes → ☐ Presence of mass ☐ Presence of calcification ☐ Extraocular extension → ☐ Optic pathway ☐ Orbit and adnexa ☐ Intracranial

Left eye: ◯ No ◯ Yes → ☐ Presence of mass ☐ Presence of calcification ☐ Extraocular extension → ☐ Optic pathway ☐ Orbit and adnexa ☐ Intracranial

2. Genetic testing (blood): ◯ No ◯ Yes → ◯ + ve ◯ - ve

3. Diagnosis:

Right eye: ◯ Confirmed Retinoblastoma ◯ Not Retinoblastoma, other diagnosis: → ☐ Congenital cataract ☐ Coat's disease ☐ Retinal Dysplasia ☐ Persistent fetal vasculature ☐ Others, specify: .....

Left eye: ◯ Confirmed Retinoblastoma ◯ Not Retinoblastoma, other diagnosis: → ☐ Congenital cataract ☐ Coat's disease ☐ Retinal Dysplasia ☐ Persistent fetal vasculature ☐ Others, specify: .....

4. Classification: International Intraocular Retinoblastoma Classification (IIRC)

Right eye: ◯ Group A ◯ Group B ◯ Group C ◯ Group D ◯ Group E

Left eye: ◯ Group A ◯ Group B ◯ Group C ◯ Group D ◯ Group E

SECTION E : MANAGEMENT (to be filled up after 3 months)

1. Chemotherapy: ◯ No ◯ Yes →

☐ Systemic Chemotherapy: ☐☐ cycles

☐ Ocular chemotherapy injection: →

☐ Subtenon Injection:

☐ Intravitreal injection:

	Right eye	Left eye
Subtenon Injection:	☐☐ times	☐☐ times
Intravitreal injection:	☐☐ times	☐☐ times

2. Enucleation:

Right eye: ◯ No ◯ Yes → HPE Result - Extension of tumour based on HPE results : ◯ Intraocular (no extraocular extension) ◯ With extraocular extension → ☐ Lamina cribrosa ☐ Bruch's membrane ☐ Superficial choroids ☐ Deep choroids ☐ Sclera ☐ Optic nerve end

Left eye: ◯ No ◯ Yes → HPE Result - Extension of tumour based on HPE results : ◯ Intraocular (no extraocular extension) ◯ With extraocular extension → ☐ Lamina cribrosa ☐ Bruch's membrane ☐ Superficial choroids ☐ Deep choroids ☐ Sclera ☐ Optic nerve end

3. Focal therapy:

Right eye: ◯ No ◯ Yes → ☐ Laser ☐ Cryotherapy

Left eye: ◯ No ◯ Yes → ☐ Laser ☐ Cryotherapy

4. Radiotherapy:

Right eye: ◯ No ◯ Yes → ☐ External beam radiation (EBRT) ☐ Plaque radiotherapy ☐ Intensity modulated radiotherapy (IMRT)

Left eye: ◯ No ◯ Yes → ☐ External beam radiation (EBRT) ☐ Plaque radiotherapy ☐ Intensity modulated radiotherapy (IMRT)

5. Traditional complementary medicine : ◯ No ◯ Yes

SECTION F : OUTCOME & COMPLICATIONS (to be filled up after 1 year)

1. Vision:

	Right eye	Left eye
1a. Vision at the last follow up soon after 1 year:	Unaided: ☐☐☐ With glasses/pin hole: ☐☐☐	Unaided: ☐☐☐ With glasses/pin hole: ☐☐☐
1b. Unable to take vision, appear to have:	◯ Normal vision ◯ Impaired vision ◯ Blind	◯ Normal vision ◯ Impaired vision ◯ Blind

2. Remission:

Right eye: ◯ No regression ◯ Partial regression → Type of regression: ☐ Flat scar ☐ Calcification ☐ Fish-flesh ☐ Mixed ◯ Complete

Left eye: ◯ No regression ◯ Partial regression → Type of regression: ☐ Flat scar ☐ Calcification ☐ Fish-flesh ☐ Mixed ◯ Complete

3. Recurrence:

Right eye: ◯ No ◯ Yes → Duration from first time treatment: ☐☐ month(s)

Left eye: ◯ No ◯ Yes → Duration from first time treatment: ☐☐ month(s)

4. Complications:

Right eye: ◯ No ◯ Yes → ☐ Socket / prosthesis related, specify ☐ Disease related, specify: ..... ☐ Chemo related, specify: ☐ Radiation related, specify:

Left eye: ◯ No ◯ Yes → ☐ Socket / prosthesis related, specify ☐ Disease related, specify: ..... ☐ Chemo related, specify: ☐ Radiation related, specify:

5. Lost to follow up : ◯ No ◯ Yes

6. Outcome by 1 year : ◯ Alive ◯ Death ◯ Unknown

AGE RELATED MACULAR DEGENERATION REGISTRY

Office use: / Centre:

Instruction: To be filled in for new AMD patients only.
Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◯ are provided, check (√) one box only.

i) Hospital / Clinic: _____ **ii) Date of Notification :** __/__/____

SECTION 1 : DEMOGRAPHY

1. Patient Name : *					
2. Identification Card Number : * *If MyKad/MyKid is not available, please complete the Old IC or Other ID document No.*	*MyKad / MyKid:*	- -	*Old IC:*		
	Other ID document No:	→	*Specify type (eg.passport, armed force ID):*		
3. Address :	Postcode :	Town / City:		State:	
4. Date of Birth: *	(dd/mm/yy)	**5. Age at presentation:** * *(Auto calculated)*	year(s)	month(s)	
6. Gender: *	◯ Male ◯ Female	**7. Ethnicity:**	◯ Malay ◯ Chinese ◯ Indian ◯ Orang Asli ◯ Melanau ◯ Kadazan/Murut/Bajau ◯ Iban ◯ Bidayuh ◯ Other, specify:		

SECTION 2 : RISK FACTOR

1. Risk Factors :

- ☐ None
- ☐ Diabetes Mellitus (DM)
- ☐ Hypertension (HPT)
- ☐ Past Stroke
- ☐ Ischaemic Heart Disease (IHD)
- ☐ Hyperclolesterolemia
- ☐ Smoking → ◯ Current ◯ Past → ☐ Right eye ☐ Left eye
- ☐ Myopia - right eye → ☐ Right eye → ◯ < 2 d ◯ 2-8 d ◯ > 8 d ☐ Left eye → ◯ < 2 d ◯ 2-8 d ◯ > 8 d
- ☐ Cataract surgery within last 3 months prior to onset of symptoms in the affected eye(s)

SECTION 3 : QUALITY OF LIFE

1. Quality of Life:		
i. Are you currently driving, at least once a while ?	◯ Yes → If Yes, do you have difficulty driving during daytime in familiar places? ◯ Yes ◯ No	◯ No → If No, reason: ◯ Never drive ◯ Gave up because of poor eye sight ◯ Others, specify:
ii. Because of your eyesight, do you have difficulty reading ordinary print in newspaper?	◯ Yes ◯ No	

SECTION 4 : MEDICAL HISTORY

1 Medical History :	**Symptoms**	
i. Metamorphopsia:	◯ Yes	◯ No
ii. Scotoma:	◯ Yes	◯ No
iii. Blurring of vision :	◯ Yes	◯ No
iv. Duration of symptoms:	____ Week(s)	____ Month(s) ____ Year(s)
v. Previous treatment for AMD:	◯ Yes → If Yes, what treatment: ☐ PDT ☐ Anti VEGF ☐ PDT+Anti VEGF ☐ Intravitral Triamcinolone ☐ Argon Laser	◯ No

SECTION 5 : CLINICAL FEATURES

1. Affected eye : ◯ Right eye ◯ Left eye ◯ Both eyes

	a) Right eye	**b) Left eye**
2.* Vision : (fill in for both affected and non-affected eye)	**Unaided:** ____ **With glasses/ Pin hole:** ____	**Unaided:** ____ **With glasses/ Pin hole:** ____
3.* Fundus Finding :	**a) Right eye**	**b) Left eye**
i. Type of AMD:	◯ Exudative ◯ Nonexudative	◯ Exudative ◯ Nonexudative
ii. Presence of Drusen:	◯ Yes → ◯ Soft ◯ Hard ◯ No	◯ Yes → ◯ Soft ◯ Hard ◯ No
iii. Presence of Central Geographic Atrophy:	◯ Yes ◯ No	◯ Yes ◯ No
iv. Presence of Pigment Epithelial Detachment:	◯ Yes ◯ No	◯ Yes ◯ No
v. Presence of Subretinal Haemorrhage:	◯ Yes ◯ No	◯ Yes ◯ No
vi. Presence of Disciform Scar:	◯ Yes ◯ No	◯ Yes ◯ No

SECTION 6 : INVESTIGATION

	a) Right eye	**b) Left eye**
1. OCT:	◯ Done ◯ Not Done → If done, findings: ☐ Subretinal Fluid ☐ Pigment Epithelial Detachment ☐ Others, specify:	◯ Done ◯ Not Done → If done, findings: ☐ Subretinal Fluid ☐ Pigment Epithelial Detachment ☐ Others, specify:
2. FFA:	◯ Done ◯ Not Done → If done, findings: i. ☐ CNV ☐ Scar ☐ PED; ii.Type of choroidal neovascularization (CNV): ☐ Classic ☐ Minimally classic ☐ Predominantly classic ☐ Occult; iii.Location of CNV: ◯ Subfoveal ◯ Juxtafoveal ◯ Extrafoveal	◯ Done ◯ Not Done → If done, findings: i. ☐ CNV ☐ Scar ☐ PED; ii.Type of choroidal neovascularization (CNV): ☐ Classic ☐ Minimally classic ☐ Predominantly classic ☐ Occult; iii.Location of CNV: ◯ Subfoveal ◯ Juxtafoveal ◯ Extrafoveal
3. ICG:	◯ Done ◯ Not Done → If done, findings: ☐ Polyps ☐ Plaque ☐ No Abnormality	◯ Done ◯ Not Done → If done, findings: ☐ Polyps ☐ Plaque ☐ No Abnormality

SECTION 7 : DIAGNOSIS *

a) Right eye	**b) Left eye**
☐ Early AMD ☐ Intermediate AMD ☐ Advanced AMD: Geographical Atrophy ☐ Advanced AMD: Disciform Scar ☐ Polypoidal choroidal vasculopathy (PCV) ☐ Choroidal neovascularization (CNV): Active ☐ Choroidal neovascularization (CNV): Resolved ☐ Others, specify:	☐ Early AMD ☐ Intermediate AMD ☐ Advanced AMD: Geographical Atrophy ☐ Advanced AMD: Disciform Scar ☐ Polypoidal choroidal vasculopathy (PCV) ☐ Choroidal neovascularization (CNV): Active ☐ Choroidal neovascularization (CNV): Resolved ☐ Others, specify:

SECTION 8 : TREATMENT *

a) Right eye	**b) Left eye**
◯ Yes → Type of treatment: ☐ PDT ☐ Anti VEGF ☐ PDT+Anti VEGF ☐ Intravitral Triamcinolone ☐ Argon Laser ☐ Others, specify: ◯ None	◯ Yes → Type of treatment: ☐ PDT ☐ Anti VEGF ☐ PDT+Anti VEGF ☐ Intravitral Triamcinolone ☐ Argon Laser ☐ Others, specify: ◯ None

Form filled by : ◯ Medical Retinal (MR) specialist ◯ Vitreo-retinal (VR) specialist ◯ MR or VR fellow ◯ Other specialist ◯ Medical officer

ADVERSE INCIDENT NOTIFICATION FORM - IOL DEFECTS

Office use: / Centre:

Intruction: Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◉ are provided, check (√) one box only.

All health care providers who noted defects on an intraocular lens either before, during or after IOL implantation are encouraged to report to the IOL Defects On-line Notification initiated and coordinated by the National Eye Databse (NED). NED is a web-based registry on eye diseases, sponsored by the MOH and Malaysian Society of Ophthalmology. The report will be monitored and reported to the Medical Device Devision, MOH for further investigation. A periodic report will also be available on NED website.

* **i) Date of notification:** ☐☐ / ☐☐ / ☐☐☐☐ (dd/mm/yyyy)

Section A: Description of an Adverse Event

1. Date of diagnosis of IOL defect: (dd/mm/yyyy)	☐☐ / ☐☐ / ☐☐☐☐	**2. Date of IOL implantation:** (dd/mm/yyyy)	☐☐ / ☐☐ / ☐☐☐☐ ☐ Estimated year (If the exact date is not known, please enter 30/06/yyyy and tick the Estimated year checkbox)

3. Type of incident: *

- ☐ IOL Opacification
- ☐ Crack on optic
- ☐ Lines on optic
- ☐ Fine deposits on optic
- ☐ Fracture or detachment of haptic(s)
- ☐ Early cataract formation subsequent to phakic IOL implantation
- ☐ Incorrect labeling of IOL, including IOL power
- ☐ Failure of IOL injector
- ☐ Others, specify: .....

4. Patient characteristics:

*	**a. Age of patient at implantation:** ☐☐	**b. Current age:** * ☐☐	**c. Gender:** *	◉ Male	◉ Female
*	**d. Ocular co-morbidity:**	☐ Glaucoma	☐ Uveitis	☐ Diabetic retinopathy	
		☐ Others, specify: _____			
*	**e. Systemic co-morbidity:**	☐ Diabetes mellitus	☐ Renal failure	☐ Hypercalcemia	
		☐ Others, specify: _____			
*	**f. Previous ocular surgery (besides cataract surgery):**	☐ Glaucoma surgery	☐ Vitreoretinal surgery		
		☐ Others, specify: _____			

Section B: Action Taken

1. Action taken: *

- ☐ None
- ☐ Monitoring
- ☐ Explantation of IOL →

*	**a. Date of explantation:**	☐☐ / ☐☐ / ☐☐☐☐ (dd/mm/yyyy)
*	**b. Replaced with new IOL?**	◉ Yes ◉ No
*	**c. Reason(s) for explantation:**	☐ Decrease in best corrected visual acuity ☐ Significant halos / glare / starbursts ☐ Significant irregular astigmatism induced ☐ Diplopia, or other significant visual disturbances ☐ IOL dislocation ☐ IOL opacification ☐ IOL defect ☐ Others, specify: _____

Section C: Outcome of Incident

1. Outcome: *

- ☐ Financial loss - Hospital or individual *(e.g. the need to buy new IOL and have another operation)*
- ☐ Distress to the patient
- ☐ Complaint from public
- ☐ Non-significant

Section D: Details of IOL

1. IOL company: *

- ◉ Alcon
- ◉ Hoya
- ◉ ERILENS
- ◉ Lenstec
- ◉ Medennium
- ◉ Ophtec
- ◉ Oll Intracular Lenses
- ◉ Corneal
- ◉ Freedom IOL
- ◉ AMO
- ◉ Tekia Inc
- ◉ Staar
- ◉ The Vision Membrane phakic IOL
- ◉ The PRL Phakic Refractive Lens
- ◉ Eyeonics
- ◉ GEL-MED International
- ◉ Not known
- ◉ Others, specify: .....

2. IOL model:

3i. IOL type: ◉ Foldable ◉ Non foldable ◉ Not known

3ii. IOL material: ◉ Acrysoft hydrophobic ◉ Acrysoft hydrophilic ◉ Silicon ◉ PMMA ◉ Not known

4. Lot No. / Serial No.:

5. IOL Expired date: (if available) ☐☐ / ☐☐ / ☐☐☐☐

6. Distributor company:

a. Name:	
b. Contact address:	
c. Email:	
d. Contact no.:	☐☐☐ - ☐☐☐☐☐☐☐ H/P: ☐☐☐ - ☐☐☐☐☐☐☐☐

Section E: Reporting Person

1. Reporting person's name: *	
2. Position: *	◉ Doctor ◉ Nurse ◉ Medical Assistant ◉ Others, specify:
3. Name of facility: *	
4. Email: *	
5. Contact no: *	☐☐☐ - ☐☐☐☐☐☐☐ H/P: ☐☐☐ - ☐☐☐☐☐☐☐☐

Thank you for reporting an adverse incident concerning an IOL. Our NED manager will be contacting you shortly.

MALAYSIAN SOCIETY OF
OPHTHALMOLOGY