National Cataract Surgery Registry

Ministry of Health Malaysia

THE FIRST REPORT OF THE NATIONAL CATARACT SURGERY REGISTRY 2002

Edited by

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FOREWARD

Congratulations to all concerned on the successful completion of the first annual report of the National Cataract Surgery Registry (NCSR).

Cataract surgery is the most common surgery performed in Ophthalmology Departments in the Ministry of Health Hospitals. Outcome of cataract surgery services therefore serves as an indicator of the quality of Ophthalmic surgical services. It is in this light that the National Cataract Surgery Registry (NCSR) was established and data collection started on the first of January 2002. A preliminary report on twenty-two participating centres for the period January to March 2002 has been published.

NCSR has since served as a tool to collect and analyze data for the evaluation of cataract surgery services in MOH hospitals. Useful information had been gathered on the pattern of cataract surgery, its surgical and service outcome over the past one year. Data can be retrieved for surgical audit by individual centres.

This report also provides an insight into the training needs for cataract surgery. I am positive that this information can be used to improve cataract surgery services at the local and national level.

On behalf of the NCSR Advisory Committee, I would like to thank all source data producers, individuals and institutions that have made it possible for the completion of this annual report. Your continued participation and contribution is of utmost importance in ensuring the sustainability of the registry.

Dr. Mariam Ismail
Chairman
NCSR Advisory Committee

ACKNOWLEDGMENTS

When we read a report, we often do not recognize the hard work and effort many people have put in to make the report a reality. The birth of the first National Cataract Surgery Registry (NCSR) annual report owed its success to many people.

Without the perseverance of staff at the participating canters in data collection, particularly the doctors who filled in the clinical record forms and the paramedical staff who collected and sent the forms to cataract surgery registry unit (CSRU), we would not have the data.

Without the painstaking follow-up in case ascertainment and tedious checking of completeness of data by the staff at CSRU, particularly the Clinical Registry Manager Staff Nurse Lee Poe Poay and Disease & Treatment Registry Associate, Ms Sharmila Bt Saari, we will not have good quality data.

Without the careful analysis of the data by Dr. LimTeck Onn and Ms Teh Poh Geok , we would not have the data made into meaningful tables and figures.

Without the conversion from figures and tables into words by the editors consisting of Dr. Goh Pik Pin, Dr. Shamala Retnasabapathy, Dr. Rajalakshmi Gopal, and Dr. Ronald Arun Das, we will not have the report.

Without the support of the Development Division of the Ministry of Health, Ophthalmology Service and Clinical Research Centre , NCSR would not be born.

We are also very grateful to:

The Ministry of Health, in particular, the Deputy Director General (Research and Technical Support) Dato` Dr. Mohd Ismail Merican, whose support was absolutely crucial to getting the NCSR started by providing the seed money in the form of a research grant (Grant number: MRG-2002-2).

The Director, Kuala Lumpur Hospital, Dr. Haji Ramlee B Haji Rahmat for contributing in the resources required.

The financial sponsors: Alcon Laboratories (M) Sdn Bhd, Advanced Medical Optics and Pharmacia Ophthalmology Malaysia Sdn Bhd (currently as Pfizer (Malaysia) Sdn Bhd).

The National Cataract Surgery Registry Advisory Committee would like to thank all the above. As the registry is an on going undertaking, your continuous supports are very much appreciated and hope for.

Thank you very much.

National Cataract Surgery Registry Advisory Committee

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Dr. Rugayah Bakri	Head, Evidence Based Medicine Clinical Research Centre, Kuala Lumpur Hospital
S/N Lee Poe Poay	Secretariat to NCSR Advisory Committee

ABOUT NATIONAL CATARACT SURGERY REGISTRY

INTRODUCTION

The National Cataract Surgery Registry is a disease outcome registry. It is a prospective, ongoing systematic collection of data pertaining to patients who have had cataract surgery. Data collected include demography, operative events, post-operative visual outcomes and probable causes for poor outcome. These data are used to calculate cataract surgery rates and to evaluate surgical outcome. Such information is useful for performance audit in each participating ophthalmology department, leading to improvement in cataract surgery service, and to assist Ministry of Health, non-governmental organization, private eye care providers and industry in blindness prevention programme planning and evaluation in the country. Analyzed data is presented in report and is disseminated to contributors and other users of the registry at a timely and regular fashion.

NCSR was established in January 2002. Till date, there are 30 source data producers/participating centres in the registry consisting of 28 ophthalmology departments from the Ministry of Health Hospitals, Hospital Angkatan Tentera Kem Terendak, and Universiti Sains Malaysia Hospital.

OBJECTIVES

The objectives of National Cataract Surgery Register are to:

1. Determine the frequency and distribution of cataract surgery in Malaysia. These are useful measures of the health burden arising of cataract and its treatment provision in the country
2. Determine the outcomes, and factors influencing outcomes of cataract surgery. This serves the needs of outcome assessment.
3. Evaluate cataract surgery services. This serves the need of accountability.
4. Stimulate and facilitate research on cataract and its management.

The objectives listed above, while typical of any cataract surgery registry, is clearly rather ambitious and certainly cannot be met right away. Thus the registry is implemented in phases.

Phase 1 of the proposed cataract surgery register shall be limited to Public Hospitals only.
Phase 2 of the proposed cataract surgery register shall expand the coverage of Phase 1 to include university, private hospitals and private ophthalmologists in the country.

SPONSORS OF NCSR

Ophthalmology Service, Ministry of Health
Clinical Research Centre, Ministry of Health

CLINICAL RESEARCH CENTRE

The Clinical Research Centre is the designated collaborating unit to the NCSR. It provides the functional capacity to support the operations of the NCSR.

The CRC is the clinical research arm of the Ministry of Health. Apart from the NCSR, CRC currently also supports the National Renal Registry, National Cancer Registry, National Neonatal Registry, National Mental Health Registry and National HIV/AIDS Treatment Registry.

In recent years, CRC has emerged to become the preferred collaborating partner for medical professional groups to establish disease and treatment registries in the country. This is because CRC possesses sophisticated facility and equipment, state of the art technology, and most importantly the trained human resources such as registry managers, epidemiologists, statisticians, information technology professionals and other supporting staff skilled in registry operations. These resources are consolidated in the Disease and Treatment Registry Unit in the CRC. The unit specializes in assisting medical professionals to establish and operate their registries.

Staff of the Clinical Research Centre (CRC) and Cataract Surgery Registry Unit (CSRU) of Disease & Treatment Registry Unit (DTRU)

Director	Dr. Zaki Morad B Mohamad Zaher
Head	Dr. Lim Teck Onn
Head of DTRU	Dr. Rugayah Bakri
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Clinical Registry Associate CSRU	Ms. Sharmila Bt Saari
Clinical Registry Associate CSRU	Mr. Mohamad Fauzan B Jamaluddin
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Network Administrator	Mr. Kevin Ng Hong Heng
Assistant Network Administrator	Mr. Adlan Ab. Rahman
Database Administrator	Ms. Lim Jie Ying
Webmaster/Desktop publisher	Mr. Patrick Lum See Kai
Programmer	Mr. Sebastian Thoo
Statistician	Ms. Teh Poh Geok

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ABBREVIATIONS

CF	Counting finger
CI	Confidence interval
CMO	Cystoid macular oedema
CSRU	Cataract surgery registry unit
ECCE	Extraca psular cataract extraction
HM	Hand movement
IOL	Intraocular lens
ICCE	Intracapsular cataract extraction
NPL	No perception of light
PCO	Posterior capsule opacification
PCR	Posterior capsule rapture
PE	Phacoemulsification
PL	Perception of light
SDP	Source data producers
VA	Visual acuity
ZD	Zonular dialysis

GLOSSARY

Advisory Committee	A committee, board, council, panel or group thereof that is established by the sponsors of the registry to govern the registry. The Advisory Committee shall direct and control the activities of the designated collaborating unit, which manages the day-to-day operations of the registry.
Advisory Committee member	An individual appointed to serve on an advisory committee. Members may have relevant expertise and/or represent the interest of SDP, users or donor.
Chairperson	An advisory committee member who is appointed to preside at committee meetings and ensure that all rules of order and conduct are maintained during each session.
Disease Register	The ongoing systematic collection, analysis and interpretation of a specific disease data essential to the planning, implementation and evaluation of clinical and public health practice, closely integrated with dissemination of these data to those who need to know. The final link in the chain is the application of these data to the management, prevention and control of the disease. A registration system includes a functional capacity for data collection, analysis and dissemination linked to clinical and public health programs.
Secretary	The individual responsible for an advisory committee's overall administrative management. He/she is ordinarily a staff provided by the designated collaborating unit for the purpose.
Source data producer	The individuals or institutions that report the required data to the registry.
Sponsor	The individuals or institutions that own the registry.

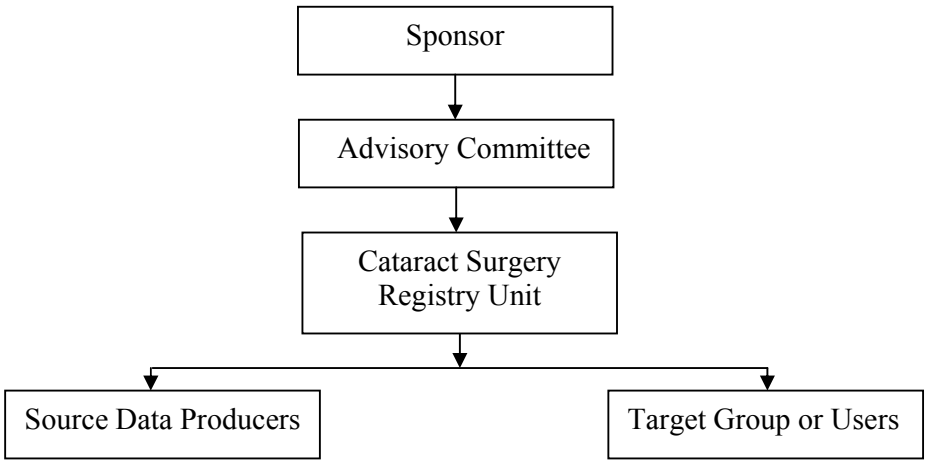
REGISTRY METHODS

The following aspects of registry methods are described below.
1. Organization and Administrative structure
2. Data standards
3. Data flow process
4. Legal aspects and confidentiality

1.ORGANISATION AND ADMINISTRATIVE STRUCTURE

In brief, **t**he organizational structure of NCSR consists of sponsors, advisory committee, cataract surgery registry unit (CSRU), source data producers and target groups/users. The Ophthalmology Service and the Clinical Research Centre, both of the MOH, jointly sponsor the registry. The NCSR is governed by an advisory committee who oversees the operations of registry. The cataract surgery registry unit, which is based at the Clinical Research Centre, MOH, provides the functional capacity to support the operation of NCSR. The source data producers are Departments of Ophthalmology, both public and private, who provide data on patients who have had cataract surgeries. The users or target groups are individuals or institutions to which the regular registry reports are addressed.

The description of the duties and functions of each entity depicted follows.



Sponsor
The registry is jointly sponsored by the Ophthalmology Service and the Clinical Research Centre; both of the MOH.

Sponsors shall
- Be responsible to Director General of Health, MOH for the effective, efficient and responsive operations of the registry.
- Provide leadership and direction for the registry.
- Establish an Advisory Committee, jointly chair the committee and appoint members to the Advisory committee. Membership should represent all interested parties. These must include source data producers, Target groups or users and representative from the Cataract Surgery Registry Unit.
- Provide the financial, human and information resources required, if necessary with financial contribution from industry or donor agencies.

Advisory Committee

An Advisory Committee for cataract surgery register shall be established by sponsors to oversee the operations of registry. Interested parties including source data producers and target groups or users are represented on this committee.

The Committee shall

- Provide leadership and direction for cataract surgery registry.
- Ensure the continuing relevance of registry.
- Determine policy and procedures for the operations of the registry.
- Designate a collaborating unit to be the Cataract Surgery Registry Unit.
- Oversee the progress of registry.
- Facilitate access to data sources.
- Galvanize commitment of all stakeholders.

Cataract Surgery Registry Unit (CSRU)

The CSRU in the Clinical Research Centre (CRC) is established to provide functional capacity to support the operation of the NCSR. Here, the collection and analysis of data, and feedback of information collected are performed. CSRU is a sophisticated unit staffed by epidemiologist, statistician, information technology personnel and other supporting staff.

To achieve the objectives of the NCSR, the function of CSRU is to ensure:

1. The complete enumeration of all cataract surgery done at the SDP centres
2. The validity of the data collected

Source Data Producers (SDP)

These are individual Departments of Ophthalmology who collects the required data. It is the most costly and difficult element of the system. As the data collected has to be systematic and uniform, and producers of source data need to be trained and motivated to ensure high data quality.

There are 29 Ophthalmology departments under Ministry of Health (MOH), one under Ministry of Defense and 3 in the local universities. Of these public operated ophthalmology departments, 30 registered as source data producers in the year 2002. This gives a coverage rate of 86% in the government hospitals. If only the MOH hospitals are taken into account, the coverage rate is 100%. Of the 30 SDPs, 22 participated for the full year. The registry aims to invite other university hospitals, private institutions and private ophthalmologists to participate in the registry in the coming year.

Users or Target groups

These are the individuals or institutions to which the regular registry reports are addressed.

They include

- Public health practitioner
- Health provider
- Industry
- Decision maker

- Researcher
- Press and public

It is their needs for information to assist in planning and implementing disease management, control and prevention activity that justify the investment in registry.

2.DATA STANDARDS

The data collected are patient demography, cause of cataract, first or second eye surgery, prior intra-ocular surgery, pre-existing ocular co-morbidity and systemic co-morbidity, pre-operative unaided and refracted vision, surgeon's status, type of admission (day care or non day care surgery), urgency of surgery, type of anesthesia, types of sedation, types of IOL (placement of IOL, material, foldable or non-foldable), and intra-ocular complication, post-operative complications, post-operative best corrected visual acuity by 12 weeks, and possible factors contributing to post-operative refracted VA of worse than 6/12.

3.DATA FLOW PROCESS

Inclusion criteria

All patients, regardless of age, who have undergone cataract surgery, including those who have combined cataract surgery, are included in the registry. Patients who have their lens removal, decided by surgeons while performing the other surgeries, usually during vitreo-retinal surgery were excluded.

Data Collection On Clinical Record Forms

Three clinical record forms are used in NCSR. They are:

i. Pre-clerking record
ii. Operative records
iii. Cataract surgery outcomes through 12 weeks post-op record

These forms are used as medical records in the day-to-day patient care at the eye departments, with duplicate copies to be sent to CSRU. By doing so, there is no additional work in data collection.

The pre-clerking records gather information on patient demography, cause of cataract, first or second eye surgery, prior intra-ocular surgery, pre-existing ocular co-morbidity and systemic co-morbidity, pre-operative unaided and refracted vision; the operative record forms capture data related to surgical procedure, surgeon's status, type of admission (day care or non day care surgery), urgency of surgery, type of anesthesia, both local and systemic sedation, types of IOL (placement of IOL, material, foldable or non-foldable), and intra-ocular complication, and the cataract outcome records collect data on post-operative complications and post-operative best corrected visual acuity by 12 weeks, as well as the possible factors contributing to post-operative refracted VA of worse than 6/12. Refer appendix 1 for the clinical record forms.

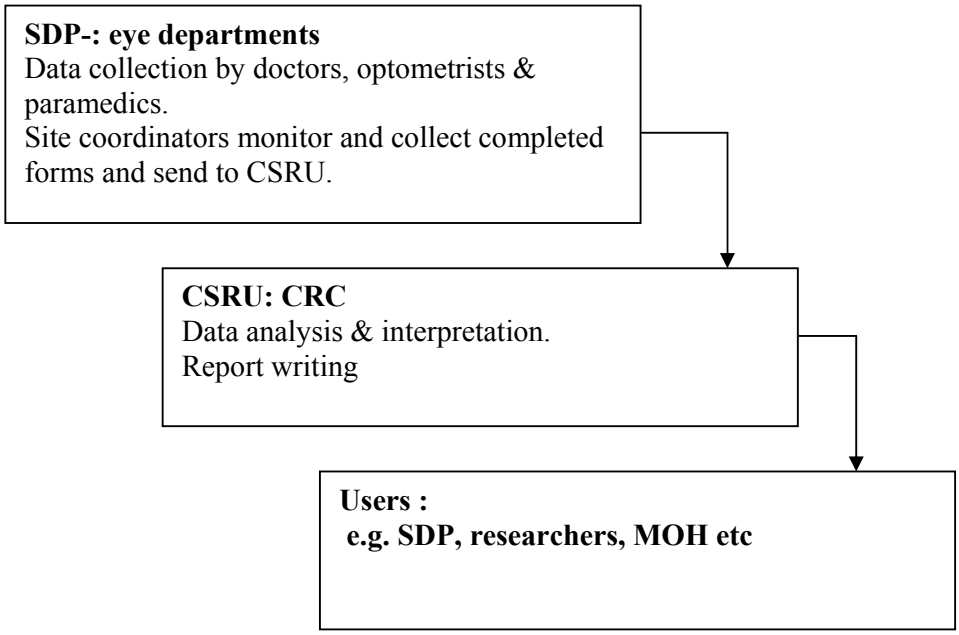
The data transferred to CSRU are kept strictly confidential with access only to authorized individual working in the CSRU.

Data flow

Doctors complete the pre-clerking forms while doing pre-clerking of patients. Upon completion of surgery, the operative records are entered. Post-operative findings and visual outcome findings are filled in the post-operative records by 12 ± 2 weeks post-op. Site coordinators ensure completeness of case ascertainment and completeness of data collection. She/he will send the completed forms, together with the operating list to CSRU in a monthly basis.

Data submission by SDP is tracked by CSRU computer system, which flags any late submission and automatically sends a reminder.

An instruction manual is used as reference and is available at http://www.crc.gov.my/ncsr website . It is also used as a training manual to new doctors and other new staff who join the eye department.



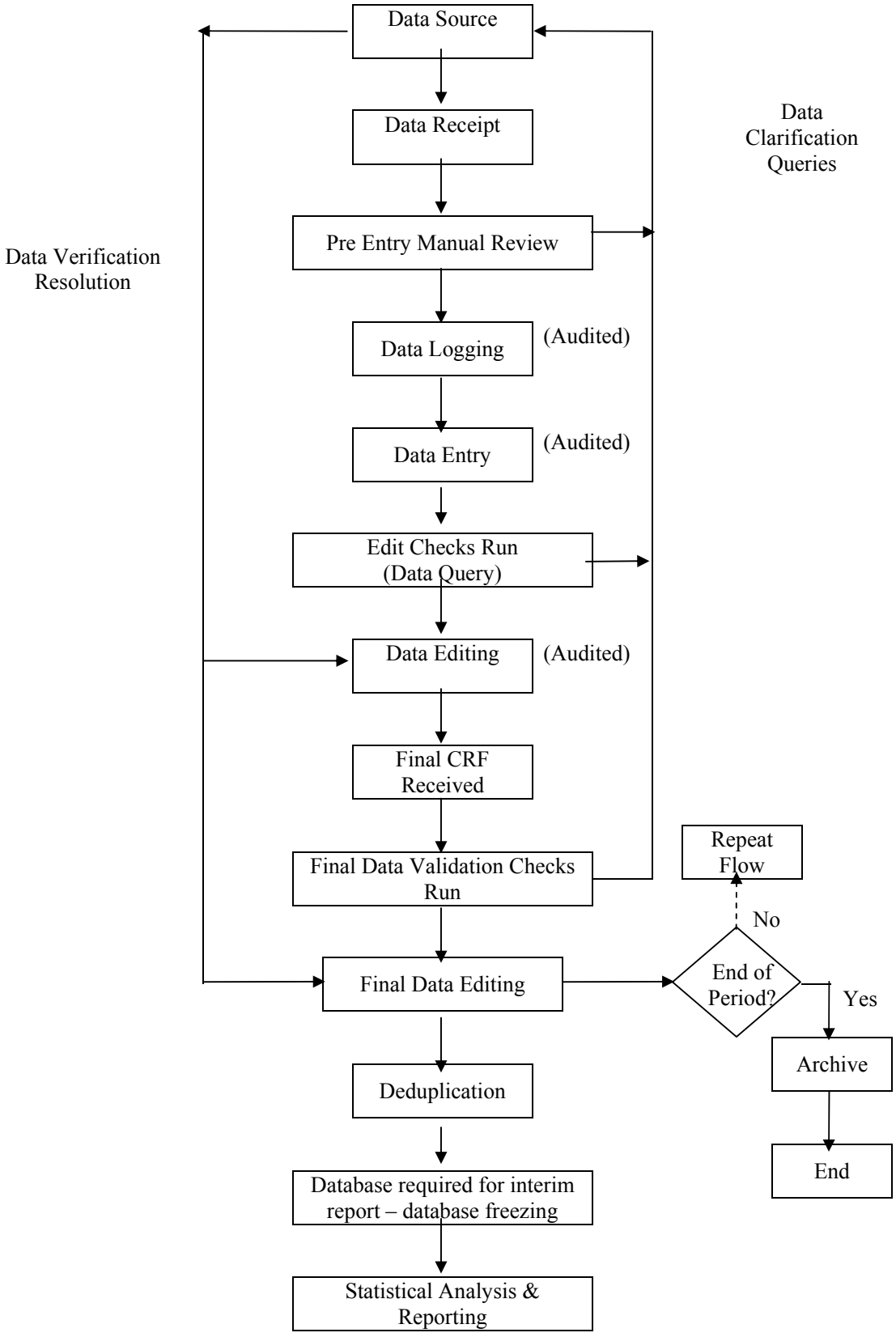
Data Management At CSRU

Visual review, data entry,data update and edit checks

Data received by the CSRU were logged- in and manually reviewed to check for completeness and error. Data without apparent problems were entered into the registry database. Edit checks were performed periodically to identify potential data errors, such as missing data, non-allowed values, out of range numeric values, inconsistent data and error with deduplication. Data queries that are resolved are then updated to the database.

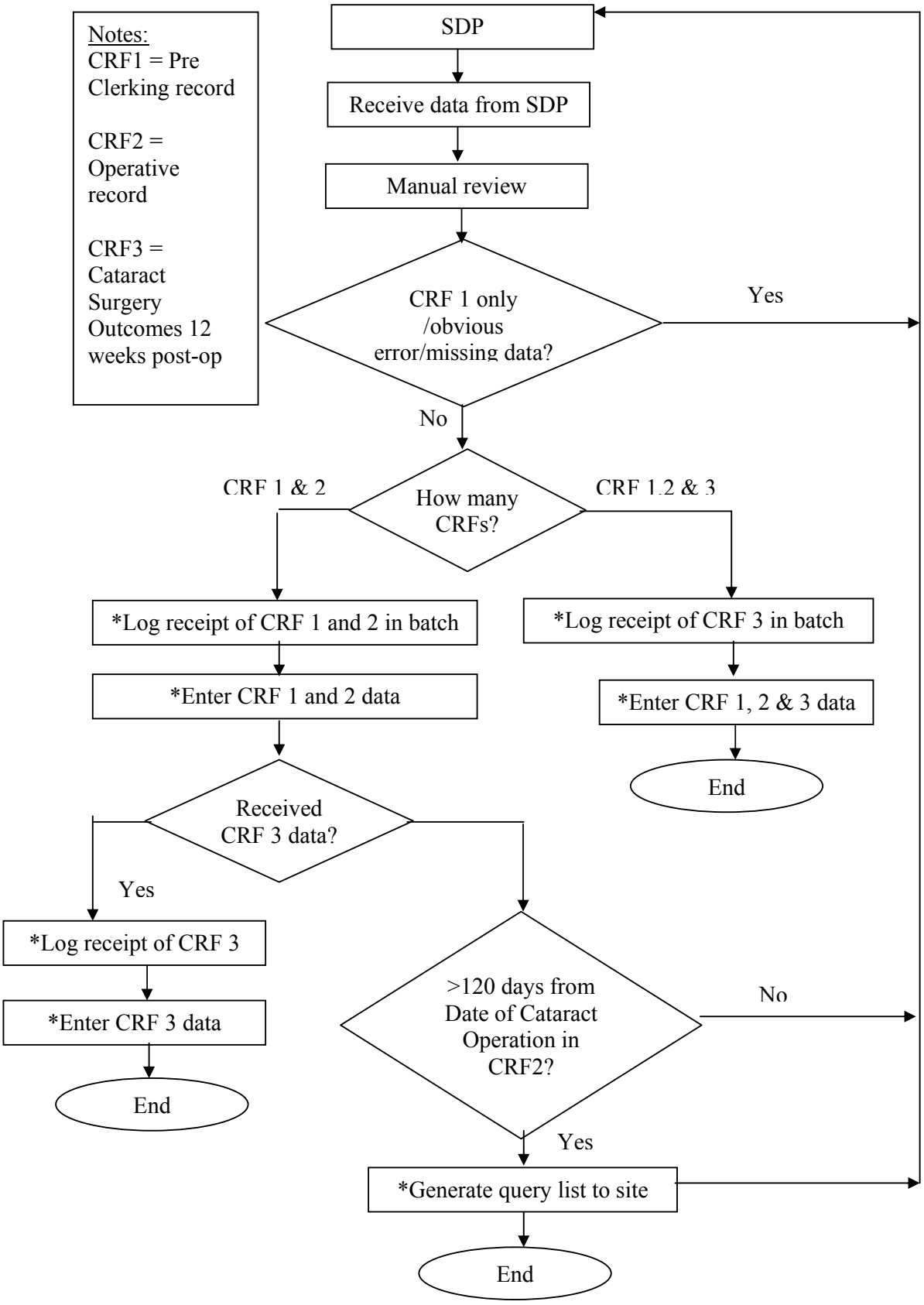
To ensure complete enumeration and validity of data, a series of tasks as shown in the figure below have to be in place.

OVERALL DATA MANAGEMENT FLOW



OVERALL DATA FLOW PROCESS

Functions



Statistical Analysis

Descriptive analysis was employed in this report. All data were described in terms of percentages except continuous data, like follow-up period and age, where summary statistics like mean, median, 25^{th} percentile and 75^{th} percentile were calculated.

We ignored the missing data and confined the analysis to available data. Therefore, no imputation was done.

4.LEGAL ASPECT AND CONFIDENTIALITY

Data transfer from source data producers is entirely voluntary. There is no legal provision to compel any individual or institution to report or transfer its data to the CSRU.

The data transferred to CSRU is of course highly sensitive and has to be kept strictly confidential with access only to authorized individual working in the CSRU. Strict data protection procedure will need to be put in place, following standard disease registration practice, and in compliance with applicable regulatory guidelines.

REPORT SUMMARY

This annual report contains data from 12,798 patients who had cataract surgery performed in January to December 2002 from 25 SDPs and whose complete set of clinical record forms were received by Cataract Surgery Registry Unit by 31st July, 2003. Data from the other 5 SDP were not included due to small number of patients (less than 100) or incomplete clinical record forms received. As not all the patients who had cataract surgery done had all 3 completed CRF, the number of surgeries did refract the true burden of cataract surgery performed in each centre.

1 PATIENTS' CHARACTERISTICS

1.1 The mean age of the patients was 64 years (youngest was 1 year, eldest was 97 years). More than half of the patients (56%) were 65 years and older.

1.2 Gender distribution was almost equal among the male and female patients.

1.3 The month of October had the highest number of cataract surgeries performed (11%) while December had the least number of cases (5%).

1.4 Centre E, J, H, and N performed more than 1000 cataract surgeries in the year.

1.5 One third (38%) of the operations were done as day care surgery and two third (62%) were done as in-patient. Centre W had most of the operations done as day care (98%). Seven centres (E, F, G, H, J, R,W) had more than 50% of their cataract surgeries performed as day care surgery. Five centres (A, C, M, Q, Y) did not have any day care services.

1.6 Two third of the patients (70%) had first eye operation while one third of the patients (30%) had second eye operation (i.e. fellow eye has had cataract surgery before).

1.7 Ocular co-morbidity was noted in 29% of the patients. The common ocular co-morbidity was diabetic retinopathy (9%) and glaucoma (6%). Seven percent of the patients had poor view of the posterior segment and thus presence of pre-existing ocular co-morbidity could not be determined.

1.8 Systemic co-morbidity was noted in 57% of the patients. Hypertension was the most common systemic co-morbidity (35%) followed by diabetes mellitus (29%), ischaemic heart disease (9%) and asthma/ COAD (5%).

1.9 Using unaided vision as measurement, there was a bimodal trend of visual status at pre-clerking, i.e. vision between 6/24 to 6/60 (26%), and vision at worse than counting fingers (CF) (52%). While using refracted vision as measurement, most patients had vision between 6/12 to 6/60 (63%). Sixty six percent of the patients presented with blindness in the eyes to be operated (blindness is defined as presenting vision of 3/60 or worse) but when refracted vision was recorded, only 26% of the eyes were in the blindness category.

1.10 Senile/age related cataract accounted for 93% and traumatic cataract accounted for 3% of the causes of cataract.

2 CATARACT SURGERY PRACTICE

2.1 Extracapsular cataract extraction (ECCE) was the most common type of cataract surgery performed. Fifty four percent of cataract surgeries were ECCE, 40% were phacoemulsification (PE), 2% PE convert to ECCE, and 3% lens aspiration. All other centres performed ECCE more frequently than other type of surgeries except for centres G, H, I, K, N, R and S where phacoemulsification was performed more frequently. Centres E, G, H, J, K, N, R, S, Y and I performed 40% or more PE. Two centres, i.e. C and M did not performed phacoemulsification surgery.

2.2 Only 3% (n=375) of the cataract surgeries had some form of combined surgery. Combined cataract and filtering surgery (n=148) was the commonest form of combined surgery (39%). Centres F and Q performed the highest number of combined surgery at 7% each. Centre W was the only centre that did not perform any combined surgery.

2.3 Almost all cataract surgeries were performed for elective reasons with only 1% of the cases requiring emergency cataract surgery. Seventeen centres performed emergency cataract surgeries and the percentage at these centres ranged between 1 to 3%.

2.4 Ninety four percent of cataract surgeries were performed under local anaesthesia (LA). The frequency of LA utilized ranged between 86-100% at the various centres. Six percent of cataract surgeries were performed under general anaesthesia (GA). At centres C, F, J, N, S, T, and U, GA was utilized for more than 6% of cases and this ranged between 7-14%.

2.5 For cataract surgeries performed under LA, the type of LA most commonly performed was subtenon anaesthesia (47%). This was followed by retrobulbar anaesthesia (26%), peribulbar anaesthesia (22%) and topical anaesthesia (12%).

Generally more than one type of LA was utilised at each centre. Though there was usually a preference towards one type of LA at each centre. Centre X performed purely one type of anaesthesia i.e. subtenon anaesthesia.

Facial block is given to prevent over action of the orbicularis oculi muscle and is not for pain relieve during surgery. This was performed at only 10 of the 25 centres. Centre C performed facial block on all cases of cataract surgery.

2.6 Cataract surgery in some cases may require more than one type of LA to provide adequate anaesthesia. Of the 94% of cataract surgeries requiring LA, 83% was given only one type of LA with the remaining 17% was given more than one type of LA. Eight centres (A, D, F, H, I, T, W and X) utilised only single LA. This was in contrast to centres B, C, G, K, Q, where more than 50% of the patients were given more than one type of LA.

2.7 Sixty three percent of cataract surgeries undergoing LA did not have any form of sedation. Four centres (H, P, R and Y) did not use any form of sedation.

Among the 37% of patients who were given sedation, oral sedation was the commonest sedation used (33%). Intravenous, intravenous plus oral and intramuscular were infrequently used (ranged between 1 to 4%) with the exception of centre C where 47% received intravenous sedation and centres C, D, and U where 60%, 90% and 30% of the cases received intramuscular sedation respectively.

2.8 Posterior chamber (PC) intraocular lens (IOL) is the normal placement of an IOL in uncomplicated surgery. PC IOLs were placed in 97% of the cataract surgeries. Two centres (C and X) achieved 100% PC IOL placement.

Anterior chamber (AC) IOLs were placed in 3% of cases and this ranged between 0 to 7% at the various centres. Some cases with AC IOL may not be a result of complication but planned based on preoperative assessment.

2.9 Three hundred and twenty seven patients (2.7%) had cataract surgery without IOL implantation. Of these, IOL had been planned for but lens implantation was not possible at the time of surgery in 72% of the cases. While 28% of the cases, no IOL was planned for implantation. Lens implantation may not have been planned for various reason based on preoperative assessment.

2.10 IOLs made of PMMA were the most frequently used IOL (73%). IOLs made of silicone and acrylic had an equal frequency of utilization at 13% each.

PMMA IOLs are non-foldable IOLs while silicone and acrylic IOL are foldable IOLs. Seventy three percent of the eyes were reported to have non-foldable IOLs and 27% had foldable IOLs.

3 CATARACT SURGERY OUTCOMES

3.1 CATARACT SURGERY COMPLICATIONS INTRA-OPERATIVE

3.1.1 Overall, 10% of the cataract surgeries performed had intra-operative complications. Posterior capsule rupture with vitreous loss was the commonest, contributing to 5% of total number of cataract surgery performed. Posterior capsule rupture without vitreous loss (1%) and zonular dialysis with vitreous loss (1%) and zonular dialysis without vitreous loss (1%) were the other types of intra-operative complications.

As for surgical techniques, PE converted to ECCE cases had the highest complication rate (41%), followed by ICCE (33%). The rates of complication in ECCE and PE were almost similar, being 10% and 9% respectively.

3.1.2 In cases of combined surgeries, 17% had intra-operative complication. Complication was seen in 14% in cataract surgeries combined with filtering surgery and 35% in those combined with vitreo-retinal surgery. Of all the combined surgeries, posterior capsule rupture with vitreous loss was the commonest intra-operative complication (9%).

3.1.3 Eighteen percent of emergency cases had intra-operative complications compared to 10% of elective cases. Posterior capsule rupture with vitreous loss was the most frequent complication in these patients (7%).

3.1.4 Eighty-eight patients (11%) who had general anaesthesia and 1240 (10%) who had local anaesthesia had intra-operative complications. Posterior capsule rupture with vitreous loss was the most frequent complication in these patients (5%).

3.1.5 The rate for any intra-operative complication according to type of local anaesthesia was 13%, 10%, 7% and 7% for subtenon, peribulbar, retrobulbar and topical anaesthesia respectively.

3.1.6 The occurrence of intra-operative complications was almost similar whether single (11%) or multiple (9%) administrations of local anaesthesia were given to patients.

3.1.7 Intravenous (12%), and intravenous plus oral (13%) had higher percentages of intra-operative complications compared to those given oral sedation alone (10%), or when no sedation was given (10%).

3.1.8 Patients who were not given any sedation have similar rate of intra-operative complication (10%) compared to those who were given single sedation (10%) or those who had multiple sedation (9%).

3.1.9 Patients who had AC IOL implanted had the highest rate of intra-operative complications (75%) as compared to those who had PCIOL (8%). There was a 27% complication rate for those who had scleral fixated IOLs. Among patients who had ACIOL, 47% of them had posterior capsule rupture with vitreous loss.

3.1.10 For those without IOL implantation, patients who were planned to have IOL implanted had higher percent of intra-operative complications at 70% compared to those who were not planned to have IOL implantation (27%). Understandably, the earlier group was those who had intra-operative complication rendering IOL implantation impossible. Posterior capsule rupture with vitreous loss was the commonest complication among patients who did not have IOL implanted (17%).

3.2 CATARACT SURGERY COMPLICATIONS POST-OPERATIVE

3.2.1 Overall, 12% of patients had postoperative complication. Central corneal edema within 4 mm of visual axis (3 %) and astigmatism of more than 3 diopters (4 %) were the most common complications seen.

3.2.2 The rate of complication when foldable IOLs were implanted was 8% as compared to 13% when non-foldable IOLs were implanted. Patients with non-

foldable IOLs had higher percentages of cystoid macular oedema (1%) and astigmatism of more than 3 diopters (5%) compared to those with foldable IOLs (0.4% and 1% respectively).

3.2.3 Without taking surgeon status and type of surgery into consideration, the rate of complications was highest when PMMA IOLs were used (13%). This is followed by acrylic IOLs (9%) and silicone IOLs (7%). The rates of severe iritis with fibrin and posterior capsular opacification (PCO) were higher in patients who had PMMA followed by acrylic IOLs and silicone IOLs (severe iritis: PMMA 0.5%, silicone 0.2%, acrylic 0.2%; PCO: PMMA 1%, silicone 0.5%, acrylic 0.5%). The rate of endophthalmitis was highest for patients who had silicone IOLs (0.41%), compared with the rates for PMMA and acrylic IOLs (0.14% and 0.12% respectively).

3.2.4 Six centres (A, B, F, L, Q, R, T) had post-operative complication rates worse than the average 12%, which ranged from 16% to 36%. Centre O has the lowest post-operative complication rate at 2%.

3.3 ANALYSIS ON CATARACT SURGERY OUTCOMES

3.3.1 Of the 12,798 patients who had cataract surgery, 2184 (17%) patients did not have refraction during the first 3 months following surgery. Their median post-operative follow-up period was at 7.9 weeks. Two third of them (75 percentile) had follow up period of 11.9 weeks.

3.3.2 Of the 12,798 patients who had cataract surgery, 10385 (81%) patients had post-operative refraction. Their median post-operative follow-up period was 11.1 week. Two third of them (75 percentile) had follow up period of 13.9 weeks. Patient who had PE had the shorter follow-up period compared to patients who had other types of surgeries.

3.4 POST-OPERATIVE VISUAL ACUITY

3.4. 1 Of the 12,798 patients operated, 12512 (99%) had data on unaided post-operative visual acuity. Of these, 39% obtained post-operative unaided VA of 6/12 or better.

Of the 12,798 patients operated 10385 (81%) had data on post-operative refracted visual acuity. Of these, 81% obtained post-operative refracted VA of 6/12 or better.

Four percent of the operated eyes had post-operative refracted VA (7% with unaided VA) at the blindness range (VA 63/60 and worse). Thus, 4% of the operated eyes who were blind, measured with unaided vision, improved to better than 3/60 when refraction was performed.

Figure 3.4.1.2 and 3.4.1.3 showed the visual improvement before and after cataract surgery. In general, post-op VA was better than pre-op VA and the

difference was more apparent when unaided VA was taken as the measurement.

3.4.2 When comparing post-op VA in relation to types of surgery, patients who had PE have higher percentage of good visual outcome (50% based on unaided VA, 87% using refracted VA), followed by ECCE (32% based on unaided VA, 77% using refracted VA)

3.4.3 When comparing age and visual outcome for all cataract surgeries, patients who were younger than 35 years and older than 75 years had lower percentage of good VA outcome of 6/12 or better. While those between 35 to 75 years had percentage of refracted VA 6/12 or better ranged from 82 to 84%.

3.4.4 In general, post-op visual outcome was similar among male (81%) and female patients (80%).

3.4.5 As a whole, patients without ocular co-morbidity (86%) had higher percentage of better visual outcome as compared to those with ocular co-morbidity(67%). Among patients who did not have ocular co-morbidity, PE (91%), followed by ECCE (83%), had good visual outcome.

In general, presence or absent of systemic co-morbidity did not affect the post-op visual outcome (81% vs. 80%).

3.4.6 In general patients who had intra-operative or post-operative complications have poorer visual outcome than patients who did not have complications.

Sixty eight percent of patients with intra-operative complications had post-operative VA 6/12 or better compared to 83% for those without intra-op complications.

For those with post-operative complications, 66% of them had refracted VA 6/12 or better compared to 83% for those without post-operative complications.

In the absent of intra-operative or post-operative complication, PE had better outcome (both at 88%) compared to the other type of cataract surgeries.

3.4.7 In general, patients who had elective surgery have better visual outcome (81%) compared to emergency cataract surgery (69%). However, patients who had ICCE had better outcome when it was performed under emergency surgery compared to elective surgery (67% vs. 49%). This might imply that when indicated, especially among patients with lens related complications such as phacomorphic, phacolytic and lens subluxation, it may be better to perform ICCE as emergency operation.

3.4.8 Patients who had local anaesthesia had better visual outcome compared to those who had general anesthesia (82% and 62% respectively). This may be because majority of patients who required general anaesthesia had pre-existing co-morbidity or they were of paediatric age group.

Patients who had topical anaesthesia had the highest percentage with good outcome (85%). This may be due to the fact that most of them had PE performed.

Percentage of good outcome was similar among those who had peribulbar (82%), retrobulbar (81%), subtenon (81%). Those who had subconjunctival anaesthesia had the lowest percent of good outcome (73%). There is no difference in visual outcome among patients who were given and those who were not given systemic sedation.

3.4.9 In general, patients who did not have combined surgeries had better outcome (81%) compared to those who had combined surgery (64%).

3.4.10 Understandably, patients who had IOL implanted had better refracted visual outcome (82%) compared to those who did not had IOL (23%).

Eighty-eight percents of patients with foldable IOL had postoperative visual acuity of 6/12 or better, compared to 79% of those with non-foldable IOL. Among those who had PE, percent of good visual outcome was similar with foldable or non-foldable IOL (89% vs. 84%).

When comparing IOL material, 79% of patients who had PMMA IOL, 89% who had silicone IOL, and 87% who had acrylic IOL had refracted visual outcome of 6/12 or better.

Among patients who had ECCE, there is no difference in visual outcome whether PMMA (79%), acrylic (78%) or silicone IOL (76%) was implanted. However, among patients who had PE, patients who had PMMA had lower percent of good outcome (84%) while there was no difference in visual outcome between patient who had silicone or acrylic IOL implantation (89% and 90% respectively).

3.4.11 When comparing visual outcome among patients who were without ocular co-morbidity (n=6425) in relation to surgeons status, percent of patient with good visual outcomes was similar whether the cataract surgery was performed by specialists, gazetting specialists or medical officers. This applies to all surgeries, ECCE and PE. The number of cataract patients performed by other types of cataract surgeries was too small for meaningful comparison.

3.4.12 When comparing among SDPs, percent of post-operative visual outcome of 6/12 or better in the 25 SDPs ranged from 69% to 88%, with the average of 81%. Ten out of 25 centres (40%) performed below average.

Among ECCE cataract surgeries, percent of good outcome ranged from 57% to 87% in all SDPs, with the average of 77%. Eleven out of 25 centres (45.6%) performed below average.

Among PE cataract surgeries, percent of good outcome ranged from 80% to 100% in all SDPs, average of 87%. Eight out of 23 centres (34.8%) performed below average.

3.5 POST-OPERATIVE REFRACTED VA IMPROVED BY ONE OR MORE LINE SNELLEN CHART

3.5.1 Of the 12,798 patients operated, only 628 patients had refracted vision for both pre-op and post op assessment. Among these 628 patients, 89% of them had one or more line of visual improvement postoperatively, while 7% experienced no change in visual acuity and 4% had reduced vision. Among those with one line visual improvement, the highest percentage was ICCE (100%, but small sample, n=2), lens aspiration (93%), followed by ECCE (92%), PE (88%), and PE converted to ECCE (79%). PE converted to ECCE had the highest percent of post-op worsening of vision of one line or more (13 %).

3.5.2 In the absent of ocular co-morbidity, 90% of patients had visual improvement of one line or more. Percentage was high in ECCE (95%), lens aspiration (92%) and PE (88%) patients compared to PE converted to ECCE patients (74%).

3.5.3 In the absent of intra-op complications, 90% of patients had visual improvement of one line or more. Percentage was higher in ECCE (92%) as compared to PE (88%).

3.5.4 In the absent of systemic co-morbidity, 92% of patients had visual improvement of one line or more. Percentage was higher in ECCE (94%) and PE (92%).

3.5.5 When comparing visual outcome in patients who had pre-operative and post-operative refracted vision, and who were without ocular co-morbidity (n=479), in relation to surgeons status, percent of patient with one or more line of visual improvement was similar whether the cataract surgery was performed by specialists, gazetting specialists or medical officers. This applies to all surgeries, ECCE and PE. The number of cataract patients performed by other types of cataract surgeries was too small for meaningful comparison.

3.6 FACTORS CONTRIBUTING TO POST-OPERATIVE VA WORSE THAN 6/12

3.6.1 Of the 2009 patients who had postoperative refracted visual acuity of worse than 6/12, only 1776 (88%) had factors identified for poor outcome.

Preexisting ocular co-morbidity (41%) was the main cause for poor outcome followed by high astigmatism (24%). Ten percent had posterior capsular opacification, 5% had clinical cystoid macular oedema, 2% had corneal decompensation, 1%, had endophthalmitis, and 1% had retinal detachment.

Among the 25 patients who were noted to have post-operative endophthalmitis, 16 (64%) had post –operative best corrected visual acuity of worse than 6/12. The prevalence of post-op endophthalmitis was 0.20 (25 cases in 12,798 cataract surgeries performed).

PATIENTS' CHARACTERISTICS

Age Distribution

Gender Distribution

Number of Surgeries by Month

Number of Surgeries by Centre

Distribution of Care Setting by Centre

Number of Patients with First Eye and Second Eye Surgery

Number of Patients with Ocular Co-Morbidity

Number of Patients with Systemic Co-Morbidity

Pre-Operative Visual Acuity Measurement

Causes of Cataract

1. PATIENTS' CHARACTERISTICS

Table 1.1: Age distributions

Age, years	**N=12798**
Mean	64
Median	66
Minimum	.1
Maximum	97
% Distributions	
Age group	
<1 year	.2
1-14 years	1
15-24 years	1
25-34 years	1
35-44 years	3
45-54 years	12
55-64 years	27
65-74 years	38
75-84 years	16
>=85 years	2

Figure 1.1: Age Distributions

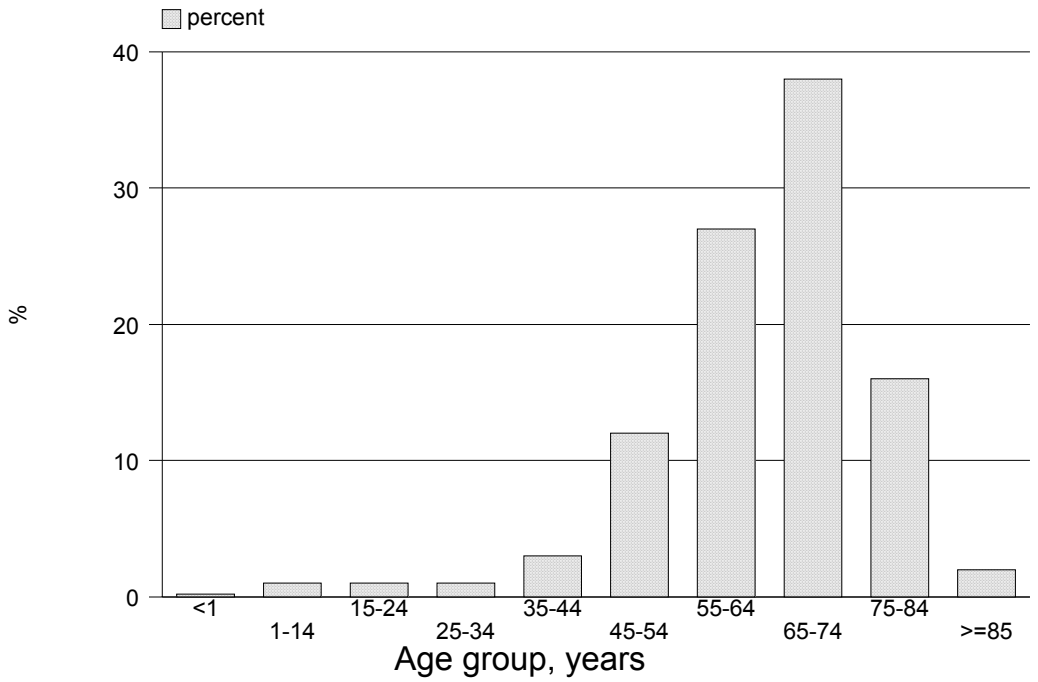


Table 1.2: Gender distributions

Gender	**N**=12798 %
Male	49
Female	51

Table 1.3: Number (%) of surgery done by month

Month	**No.**	**%**
N	12798	100
January	1064	8
February	838	7
March	1166	9
April	986	8
May	1018	8
June	1127	9
July	1207	9
August	1210	9
September	1184	9
October	1346	11
November	1003	8
December	649	5

Figure 1.3: Number (%) of surgery

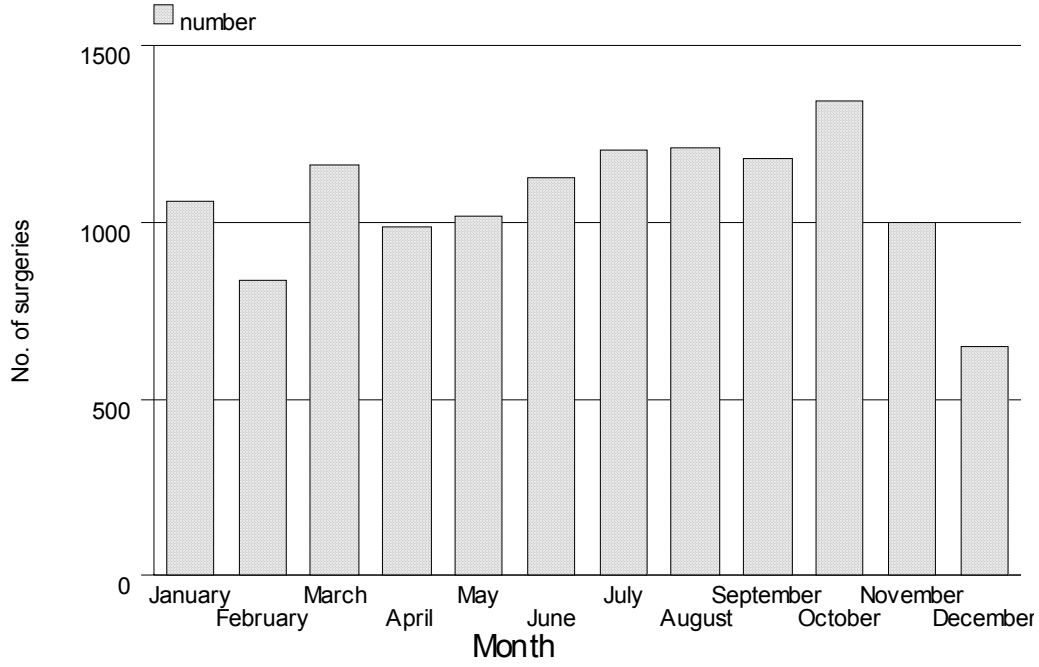


Table 1.4: Number of surgery done by centre

Centre	No.	%
All sites	12798	100
A	154	1
B	956	7
C	129	1
D	294	2
E	1079	8
F	422	3
G	737	6
H	1017	8
I	519	4
J	1141	9
K	480	4
L	830	6
M	260	2
N	1009	8
O	414	3
P	429	3
Q	188	1
R	392	3
S	421	3
T	801	6
U	268	2
V	285	2
W	213	2
X	127	1
Y	233	2

Figure 1.4: Number of surgery done by centre

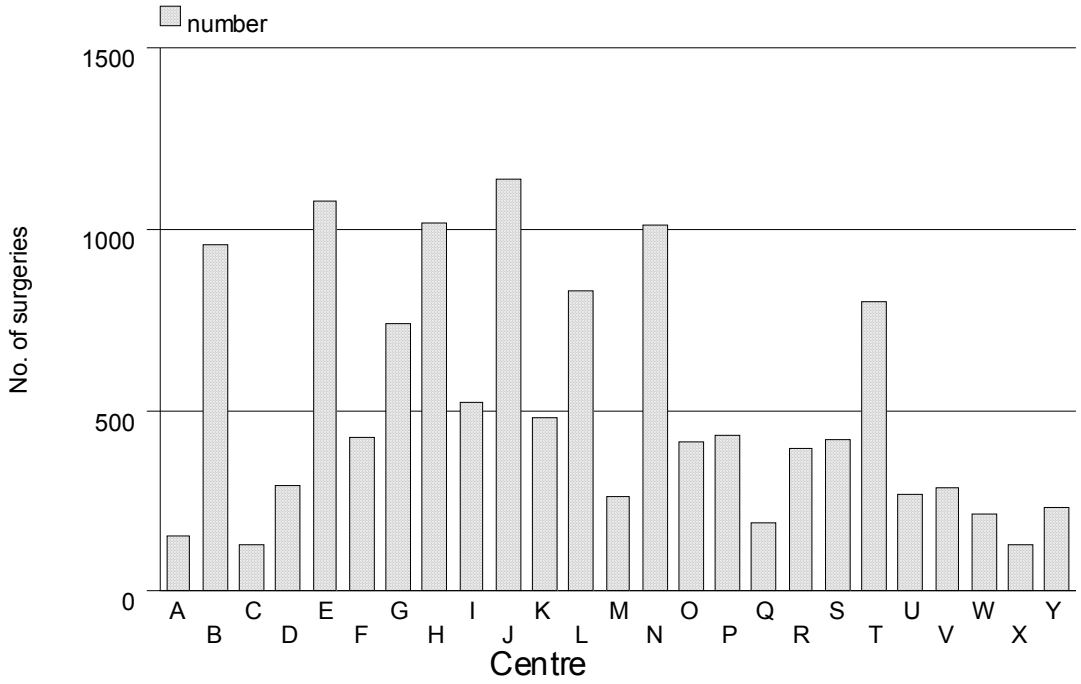


Table 1.5: Distribution of care setting by centre

Centre		Care setting	
	N	% Day care	% In-patient
All sites	12798	38	62
A	154	0	100
B	956	24	76
C	129	0	100
D	294	3	97
E	1079	89	11
F	422	53	47
G	737	81	19
H	1017	88	12
I	519	2	98
J	1141	67	33
K	480	11	89
L	830	42	58
M	260	0	100
N	1009	10	90
O	414	12	88
P	429	8	92
Q	188	0	100
R	392	53	47
S	421	42	58
T	801	3	97
U	268	1	99
V	285	5	95
W	213	98	2
X	127	16	84
Y	233	0	100

Figure 1.5: Distribution of day care and in patient by centre

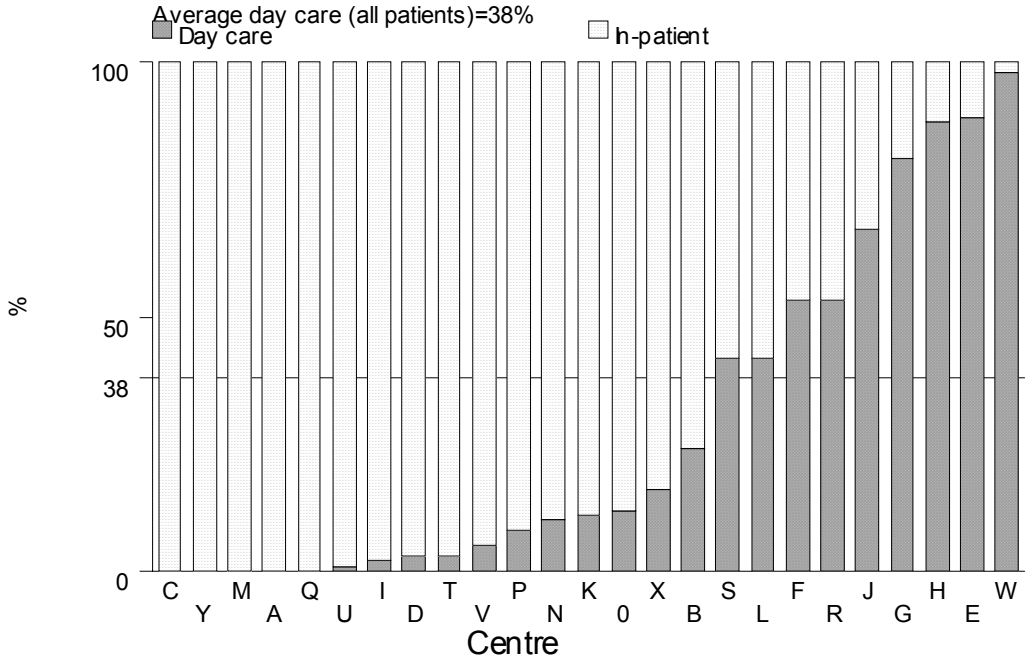


Table 1.6: Number of patients with first eye and second eye surgery

Type of surgery	No.	%
N	12798	100
First eye	8958	70
Second eye	3840	30

Table 1.7: Number of patients with ocular co-morbidity

Patients with ocular co-morbidity	**No.**	**%**
N	12798	100
Patients with any ocular co-morbidity	3691	29
Patients with specific ocular co-morbidity		
Anterior segment		
1.Pterygium involving the cornea	342	3
2.Corneal opacity	184	1
3.Glaucoma	795	6
4.Chronic uveitis	54	0
5.Pseudoexfoliation	184	1
Len related complication		
1.Phacomorphic	106	1
2.Phacolytic	61	0
3.Subluxated/Disclosed	87	1
Posterior segment		
1.Diabetic Retinopathy: Non Proliferative	642	5
2.Diabetic Retinopathy: Proliferative	218	2
3.Diabetic Retinopathy: CSME	96	1
4.Diabetic Retinopathy: Vitreous haemorrhage	66	1
5.ARMD	145	1
6.Other macular disease (includes hole or scar)	77	1
7.Optic nerve disease, any type	43	0
8.Retinal detachment	70	1
9.Cannot be assessed	884	7
Miscellaneous		
1.Amblyopia	64	1
2.Significant previous eye trauma	52	0
3.Pre-existing non glaucoma field defect	2	0
Other	380	3

Table 1.8: Number of patients with systemic co-morbidity

Patients with systemic co-morbidity	**No.**	**%**
N	12798	100
Patients with any systemic co-morbidity	7264	57
Patients with specific systemic co-morbidity		
1.Hypertension	4529	35
2.Diabetes Mellitus	3694	29
3.Ischaemic Heart Disease	1148	9
4.Renal Failure	211	2
5.Cerebrovascular accident	106	1
6.COAD/Asthma	669	5
7.Hansen's Disease	11	0
8.Allergies	55	0
Other	869	7

Table 1.9: Pre-operative visual acuity measurement

Pre-operative VA	Unaided		Refracted	
	N=12691	100%	N=700	100%
	No.	%	No.	%
6/5	2	0	1	0
6/6	20	0	11	2
6/9	71	1	52	7
6/12	188	1	91	13
6/18	435	3	104	15
6/24	837	7	89	13
6/36	1058	8	95	14
6/60	1410	11	56	8
5/60	208	2	5	1
4/60	181	1	8	1
3/60	336	3	17	2
2/60	463	4	23	3
1/60	853	7	22	3
CF	2701	21	54	8
HM	2922	23	52	7
PL	975	8	20	3
NPL	31	0	0	0

Figure 1.9: Pre-operative visual acuity measurement

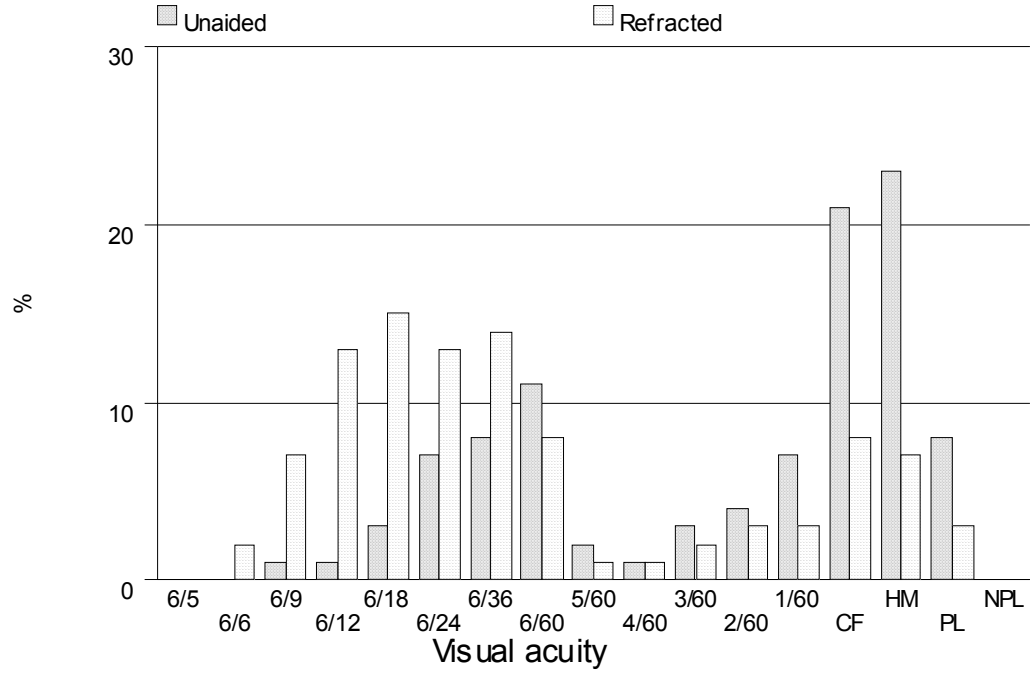


Table 1.10: Causes of cataract

Causes of Cataract	No.	%
N	12793	100
Primary cataract		
Senile/age related	11960	93
Congenital	130	1
Development	155	1
Other	49	0
Secondary cataract		
Trauma	325	3
Drug induced	53	0
Surgery induced	23	0
Other	98	1

CATARACT SURGERY PRACTICE

Distribution of Types of Cataract Surgery by Centre

Distribution of Combined Surgery by Centre

Proportion of Nature of Cataract Surgery

Types of Anaesthesia

Types of Local Anaesthesia

Distribution of Single and Multiple Local Anaesthesia

Types of Sedation given to Patients Having Local Anaesthesia

Distribution of IOL Placement

Distribution of Cataract Surgery Without IOL

Distribution of IOL – Materials and Types

2. CATARACT SURGICAL PRACTICES

Table 2.1: Distribution of types of cataract surgery by centre

Centre	Types of cataract surgery													
	All surgeries		Lens aspiration		ECCE		PE		PE converted to ECCE		ICCE		Secondary IOL Implant	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Centres	12798	100	372	3	6914	54	5085	40	311	2	81	1	35	0
A	154	100	5	3	84	55	60	39	4	3	0	0	1	1
B	956	100	16	2	649	68	263	28	15	2	7	1	6	1
C	129	100	6	5	123	95	0	0	0	0	0	0	0	0
D	294	100	8	3	261	89	22	7	3	1	0	0	0	0
E	1079	100	29	3	513	48	496	46	31	3	6	1	4	0
F	422	100	29	7	223	53	157	37	8	2	4	1	1	0
G	737	100	28	4	208	28	488	66	5	1	5	1	3	0
H	1017	100	28	3	356	35	593	58	33	3	7	1	0	0
I	519	100	11	2	234	45	255	49	18	3	0	0	1	0
J	1141	100	30	3	557	49	509	45	34	3	10	1	1	0
K	480	100	25	5	161	34	273	57	14	3	2	0	5	1
L	830	100	20	2	606	73	169	20	21	3	13	2	1	0
M	260	100	4	2	256	98	0	0	0	0	0	0	0	0
N	1009	100	24	2	449	44	519	51	9	1	6	1	2	0
O	414	100	21	5	244	59	133	32	13	3	2	0	1	0
P	429	100	10	2	232	54	153	36	34	8	0	0	0	0
Q	188	100	2	1	184	98	1	1	1	1	0	0	0	0
R	392	100	5	1	176	45	205	52	0	0	6	2	0	0
S	421	100	9	2	183	43	206	49	18	4	2	0	3	1
T	801	100	27	3	431	54	315	39	21	3	4	0	3	0
U	268	100	19	7	219	82	19	7	9	3	1	0	1	0
V	285	100	8	3	181	64	84	29	9	3	3	1	0	0
W	213	100	1	0	162	76	43	20	5	2	2	1	0	0
X	127	100	0	0	99	78	26	20	2	2	0	0	0	0
Y	233	100	7	3	123	53	96	41	4	2	1	0	2	1

Figure 2.1: Distribution of types of cataract surgery by centre

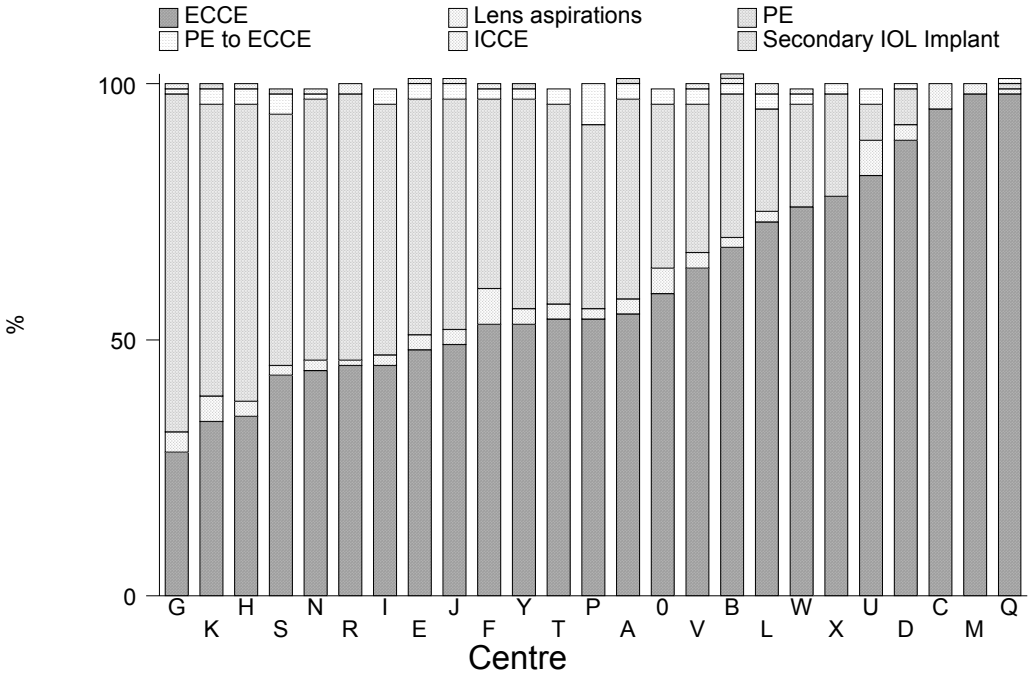


Table 2.2: Distribution of combined surgery by centre

Centre		Combined surgery											
	All surgeries	Any Combined surgery		Pterygium surgery		Filtering surgery		Vitreo-retinal surgery		Penetrating Keratoplasty		Other	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Centres	12798	375	3	86	1	148	1	26	0	1	0	124	1
A	154	10	6	7	5	3	2	0	0	0	0	1	1
B	956	51	5	12	1	11	1	1	0	0	0	31	3
C	129	6	5	3	2	0	0	0	0	0	0	4	3
D	294	12	4	2	1	9	3	0	0	0	0	1	0
E	1079	36	3	1	0	23	2	4	0	0	0	9	1
F	422	28	7	8	2	14	3	2	0	1	0	5	1
G	737	31	4	13	2	3	0	0	0	0	0	15	2
H	1017	34	3	5	0	16	2	5	0	0	0	8	1
I	519	7	1	5	1	1	0	0	0	0	0	1	0
J	1141	21	2	5	0	13	1	2	0	0	0	1	0
K	480	10	2	2	0	0	0	4	1	0	0	5	1
L	830	28	3	0	0	16	2	2	0	0	0	10	1
M	260	7	3	0	0	4	2	0	0	0	0	3	1
N	1009	10	1	0	0	6	1	0	0	0	0	4	0
O	414	5	1	0	0	2	0	0	0	0	0	3	1
P	429	12	3	1	0	5	1	0	0	0	0	6	1
Q	188	14	7	10	5	3	2	1	1	0	0	0	0
R	392	6	2	0	0	3	1	0	0	0	0	3	1
S	421	9	2	4	1	2	0	1	0	0	0	2	0
T	801	16	2	1	0	6	1	3	0	0	0	6	1
U	268	8	3	3	1	2	1	0	0	0	0	3	1
V	285	8	3	3	1	2	1	1	0	0	0	2	1
W	213	1	0	0	0	1	0	0	0	0	0	0	0
X	127	1	1	0	0	1	1	0	0	0	0	0	0
Y	233	4	2	1	0	2	1	0	0	0	0	1	0

Table 2.3: Proportion of nature of cataract surgery

Centre		Nature of cataract surgery			
		Emergency		Elective	
	N	No.	%	No.	%
All Centres	12798	141	1	12657	99
A	154	1	1	153	99
B	956	15	2	941	98
C	129	4	3	125	97
D	294	6	2	288	98
E	1079	12	1	1067	99
F	422	5	1	417	99
G	737	2	0	735	100
H	1017	5	0	1012	100
I	519	1	0	518	100
J	1141	21	2	1120	98
K	480	9	2	471	98
L	830	7	1	823	99
M	260	5	2	255	98
N	1009	7	1	1002	99
O	414	4	1	410	99
P	429	1	0	428	100
Q	188	0	0	188	100
R	392	0	0	392	100
S	421	8	2	413	98
T	801	17	2	784	98
U	268	5	2	263	98
V	285	2	1	283	99
W	213	1	0	212	100
X	127	0	0	127	100
Y	233	3	1	230	99

Table 2.4: Type of anaesthesia

Centre		Types of anaesthesia			
		General		Local	
	N	No.	%	No.	%
All Centres	12798	818	6	11980	94
A	154	8	5	146	95
B	956	48	5	908	95
C	129	12	9	117	91
D	294	7	2	287	98
E	1079	70	6	1009	94
F	422	58	14	364	86
G	737	28	4	709	96
H	1017	53	5	964	95
I	519	9	2	510	98
J	1141	79	7	1062	93
K	480	31	6	449	94
L	830	45	5	785	95
M	260	25	10	235	90
N	1009	68	7	941	93
O	414	26	6	388	94
P	429	24	6	405	94
Q	188	9	5	179	95
R	392	24	6	368	94
S	421	35	8	386	92
T	801	98	12	703	88
U	268	38	14	230	86
V	285	8	3	277	97
W	213	0	0	213	100
X	127	3	2	124	98
Y	233	12	5	221	95

Figure 2.4: Type of anaesthesia

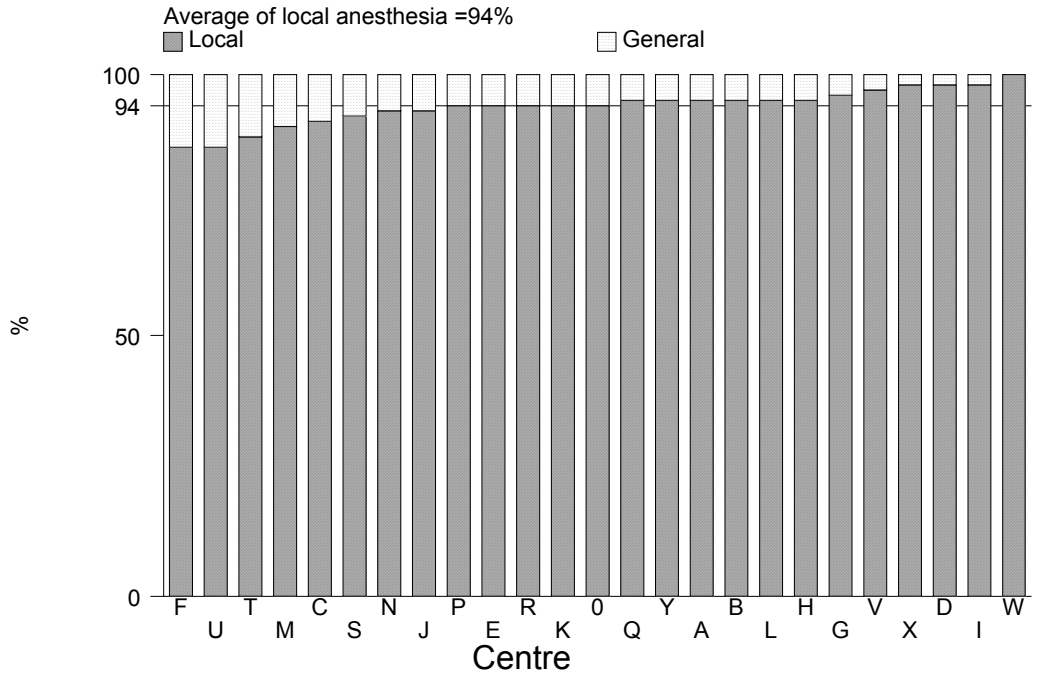


Table 2.5: Type of local anaesthesia

Centre		Local anaesthesia													
		Retrobulbar		Peribulbar		Subtenon		Subconjunctival		Facial block		Topical		Other	
	N	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Centres	11980	3100	26	2601	22	5647	47	28	0	1348	11	1406	12	1	0
A	146	0	0	0	0	145	99	1	1	0	0	0	0	0	0
B	908	829	91	11	1	86	9	0	0	509	56	7	1	0	0
C	117	116	99	0	0	0	0	0	0	117	100	0	0	0	0
D	287	4	1	1	0	283	99	0	0	0	0	0	0	0	0
E	1009	27	3	392	39	604	60	4	0	10	1	33	3	0	0
F	364	0	0	0	0	201	55	3	1	0	0	160	44	0	0
G	709	37	5	611	86	98	14	1	0	124	17	380	54	0	0
H	964	0	0	3	0	510	53	0	0	0	0	453	47	0	0
I	510	3	1	0	0	507	99	0	0	0	0	0	0	0	0
J	1062	45	4	7	1	1004	95	0	0	2	0	10	1	1	0
K	449	315	70	144	32	2	0	2	0	333	74	92	20	0	0
L	785	72	9	710	90	83	11	3	0	3	0	0	0	0	0
M	235	233	99	0	0	0	0	0	0	65	28	1	0	0	0
N	941	721	77	94	10	76	8	5	1	0	0	54	6	0	0
O	388	67	17	320	82	3	1	0	0	0	0	0	0	0	0
P	405	3	1	0	0	344	85	3	1	0	0	62	15	0	0
Q	179	0	0	179	100	0	0	0	0	177	99	1	1	0	0
R	368	25	7	0	0	200	54	0	0	0	0	148	40	0	0
S	386	316	82	60	16	47	12	1	0	0	0	4	1	0	0
T	703	67	10	2	0	633	90	1	0	0	0	1	0	0	0
U	230	17	7	4	2	207	90	4	2	0	0	0	0	0	0

Centre		Local anaesthesia													
		Retrobulbar		Peribulbar		Subtenon		Subconjunctival		Facial block		Topical		Other	
	N	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
V	277	2	1	1	0	276	100	0	0	0	0	0	0	0	0
W	213	0	0	1	0	212	100	0	0	0	0	0	0	0	0
X	124	0	0	0	0	124	100	0	0	0	0	0	0	0	0
Y	221	201	91	61	28	2	1	0	0	8	4	0	0	0	0

* % May add to more than 100 % as one patient might have more than one type of local anaesthesia.

Table 2.6: Distribution of single and multiple local anaesthesia

Centre		Local anaesthesia			
		Single		Multiple	
	N	No.	%	No.	%
All Centres	11980	9997	83	1983	17
A	146	146	100	0	0
B	908	388	43	520	57
C	117	1	1	116	99
D	287	286	100	1	0
E	1009	954	95	55	5
F	364	364	100	0	0
G	709	207	29	502	71
H	964	962	100	2	0
I	510	510	100	0	0
J	1062	1055	99	7	1
K	449	113	25	336	75
L	785	700	89	85	11
M	235	171	73	64	27
N	941	932	99	9	1
O	388	386	99	2	1
P	405	398	98	7	2
Q	179	2	1	177	99
R	368	363	99	5	1
S	386	346	90	40	10
T	703	702	100	1	0
U	230	228	99	2	1
V	277	275	99	2	1
W	213	213	100	0	0
X	124	124	100	0	0
Y	221	171	77	50	23

Table 2.7: Type of sedation given to patient who had local anaesthesia

Centre		Types of sedation									
		No sedation		**Oral alone**		**Intravenous alone**		**Intravenous plus oral**		**Intra-muscular**	
	N	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
All Centres	11980	7507	63	3995	33	108	1	83	1	426	4
A	146	139	95	5	3	0	0	1	1	1	1
B	908	423	47	450	50	21	2	18	2	0	0
C	117	4	3	0	0	55	47	0	0	70	60
D	287	7	2	119	41	0	0	2	1	258	90
E	1009	778	77	194	19	12	1	24	2	1	0
F	364	358	98	4	1	1	0	1	0	0	0
G	709	705	99	2	0	2	0	0	0	0	0
H	964	962	100	1	0	1	0	0	0	0	0
I	510	507	99	3	1	0	0	0	0	0	0
J	1062	406	38	653	61	3	0	1	0	0	0
K	449	445	99	4	1	0	0	0	0	0	0
L	785	133	17	620	79	4	1	21	3	27	3
M	235	24	10	211	90	0	0	0	0	0	0
N	941	45	5	894	95	2	0	0	0	0	0
O	388	26	7	362	93	0	0	0	0	0	0
P	405	405	100	0	0	0	0	0	0	0	0
Q	179	6	3	173	97	0	0	0	0	0	0
R	368	367	100	0	0	1	0	0	0	0	0
S	386	376	97	7	2	1	0	2	1	0	0
T	703	505	72	193	27	1	0	4	1	0	0
U	230	60	26	92	40	3	1	9	4	69	30
V	277	272	98	5	2	0	0	0	0	0	0
W	213	211	99	2	1	0	0	0	0	0	0
X	124	123	99	1	1	0	0	0	0	0	0
Y	221	220	100	0	0	1	0	0	0	0	0

* % may add to more than 100 % as one patient might have more than one type of sedation.

Table 2.8: Distribution of IOL placement

Centre		Cataract surgery with IOL					
		Posterior chamber IOL		Anterior chamber IOL		Scleral fixated IOL	
	N	No.	%	No.	%	No.	%
All Centres	12471	12074	97	386	3	11	0
A	152	142	93	10	7	0	0
B	935	907	97	28	3	0	0
C	115	115	100	0	0	0	0
D	291	286	98	5	2	0	0
E	1053	999	95	54	5	0	0
F	407	389	96	16	4	2	0
G	707	682	96	25	4	0	0
H	969	948	98	20	2	1	0
I	510	498	98	12	2	0	0
J	1099	1041	95	57	5	1	0
K	469	450	96	19	4	0	0
L	809	793	98	14	2	2	0
M	260	250	96	10	4	0	0
N	983	970	99	13	1	0	0
O	406	396	98	10	2	0	0
P	423	417	99	6	1	0	0
Q	180	177	98	3	2	0	0
R	383	366	96	17	4	0	0
S	419	409	98	7	2	3	1
T	785	745	95	38	5	2	0
U	261	254	97	7	3	0	0
V	285	282	99	3	1	0	0
W	212	203	96	9	4	0	0
X	127	127	100	0	0	0	0
Y	231	228	99	3	1	0	0

Table 2.9: Distribution of cataract surgery without IOL

Centre		Cataract surgery without IOL			
		IOL planned but not implanted		No IOL was planned	
	N	No.	%	No.	%
All Centres	327	93	28	234	72
A	2	0	0	2	100
B	21	6	29	15	71
C	14	4	29	10	71
D	3	1	33	2	67
E	26	12	46	14	54
F	15	1	7	14	93
G	30	6	20	24	80
H	48	13	27	35	73
I	9	3	33	6	67
J	42	10	24	32	76
K	11	0	0	11	100
L	21	9	43	12	57
M	0	0	0	0	0
N	26	7	27	19	73
O	8	1	13	7	88
P	6	3	50	3	50
Q	8	2	25	6	75
R	9	7	78	2	22
S	2	1	50	1	50
T	16	3	19	13	81
U	7	4	57	3	43
V	0	0	0	0	0
W	1	0	0	1	100
X	0	0	0	0	0
Y	2	0	0	2	100

Table 2.10: Distribution of IOL- materials and types

IOL	No.	%
N	12472	100
Materials		
PMMA	9161	73
Silicone	1670	13
Acrylic	1641	13
Other	0	0
Types		
Foldable	3311	27
Non-foldable	9161	73

CATARACT SURGERY OUTCOMES

Cataract Surgery Complications – Intra-Operative

Cataract Surgery Complications – Post-Operative

Analysis On Cataract Surgery Visual Outcome

Post-Operative Visual Acuity

Post-Operative Refracted VA Improved by One or More Line of Snellen Chart

Factors Contributing to Post-Operative Visual Acuity Worse than 6/12

3. CATARACT SURGERY OUTCOMES

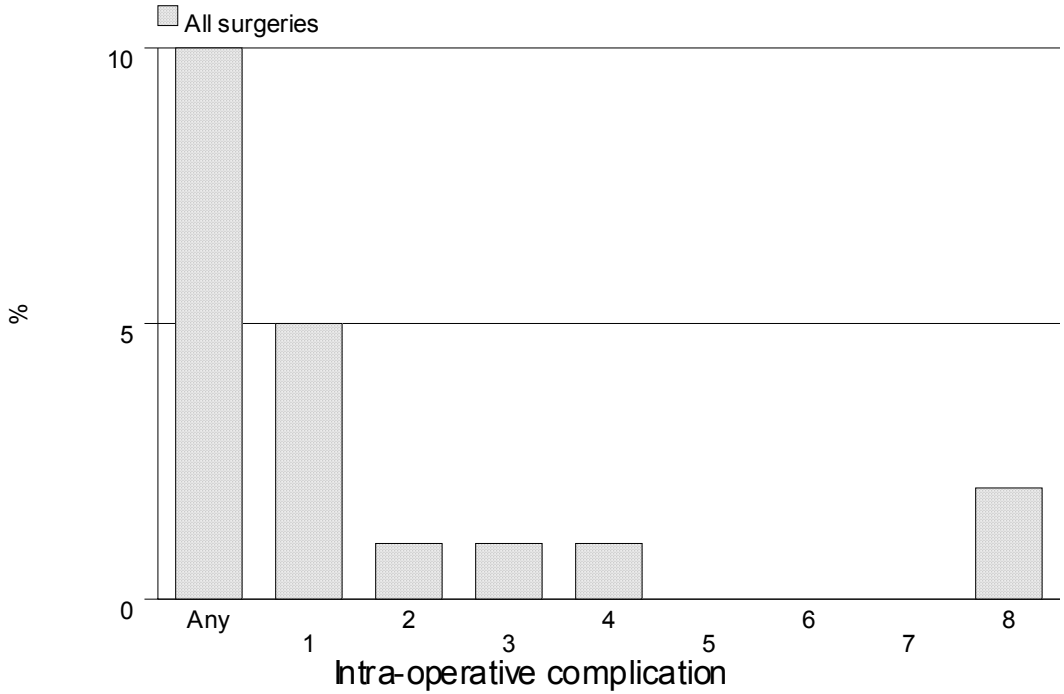
3.1 Cataract Surgery Complications - Intra-Operative

Table 3.1.1: Distribution of intra-operative complications by type of cataract surgery

Type of intra-operative complications	Types of cataract surgery													
	All surgeries		Lens Aspiration		ECCE		PE		PE to ECCE		ICCE		Secondary IOL Implant	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N	12798	100	372	100	6914	100	5085	100	311	100	81	100	35	100
Any intra-op complication	1328	10	51	14	684	10	438	9	128	41	27	33	0	0
1.Posterior capsule rupture with vitreous loss	584	5	22	6	291	4	202	4	66	21	3	4	0	0
2.Posterior capsule rupture without vitreous loss	189	1	10	3	65	1	107	2	7	2	0	0	0	0
3.Zonular dialysis with vitreous loss	150	1	3	1	82	1	30	1	20	6	15	19	0	0
4.Zonular dialysis without vitreous loss	96	1	8	2	50	1	32	1	5	2	1	1	0	0
5.Loss of nucleus material into vitreous	13	0	0	0	3	0	7	0	3	1	0	0	0	0
6.Choroidal/suprachoroidal haemorrhage	5	0	0	0	4	0	1	0	0	0	0	0	0	0
7.Significant trauma to cornea or iris	56	0	2	1	36	1	14	0	3	1	1	1	0	0
8.Other	274	2	8	2	167	2	62	1	29	9	8	10	0	0

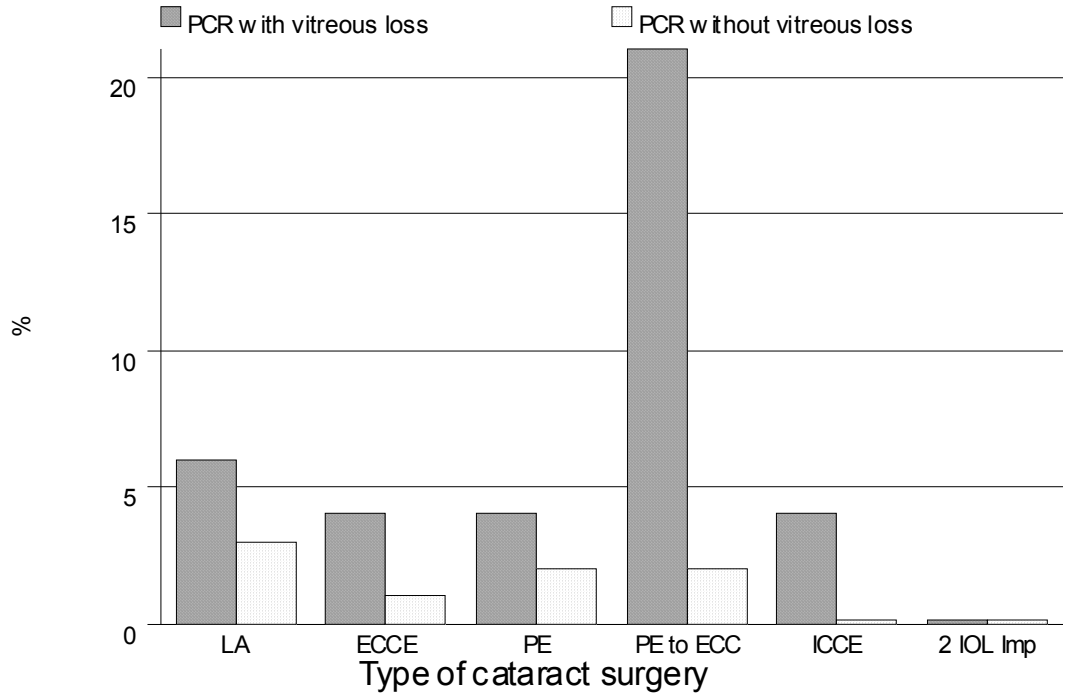
* Number in each column might add up to be more than that recorded at row with ‘ Any intra-op complication’ as one patient might have more than one type of intra-operative complications.

Figure 3.1.1.1: Distribution of intra-operative complication



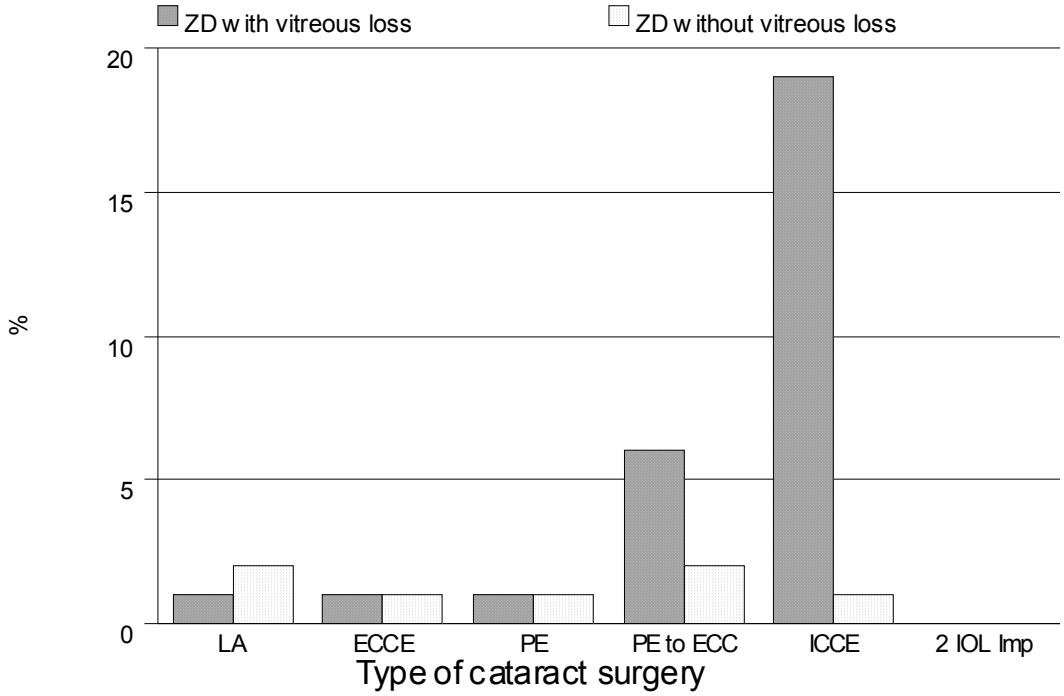
Intra-operative complication: Index refers to table 3.1.1

Figure 3.1.1.2: Distribution of intra-operative complication by posterior capsule rupture with vitreous loss and posterior capsule rupture without vitreous loss



- LA=Lens aspiration
- 2 IOL Imp=Secondary IOL Implant

Figure 3.1.1.3: Distribution of intra-operative complication by zonular dialysis with vitreous loss and zonular dialysis without vitreous loss



- LA=Lens aspiration
- 2 IOL Imp=Secondary IOL Implant

Table 3.1.2: Distribution of intra-operative complications by combined surgery

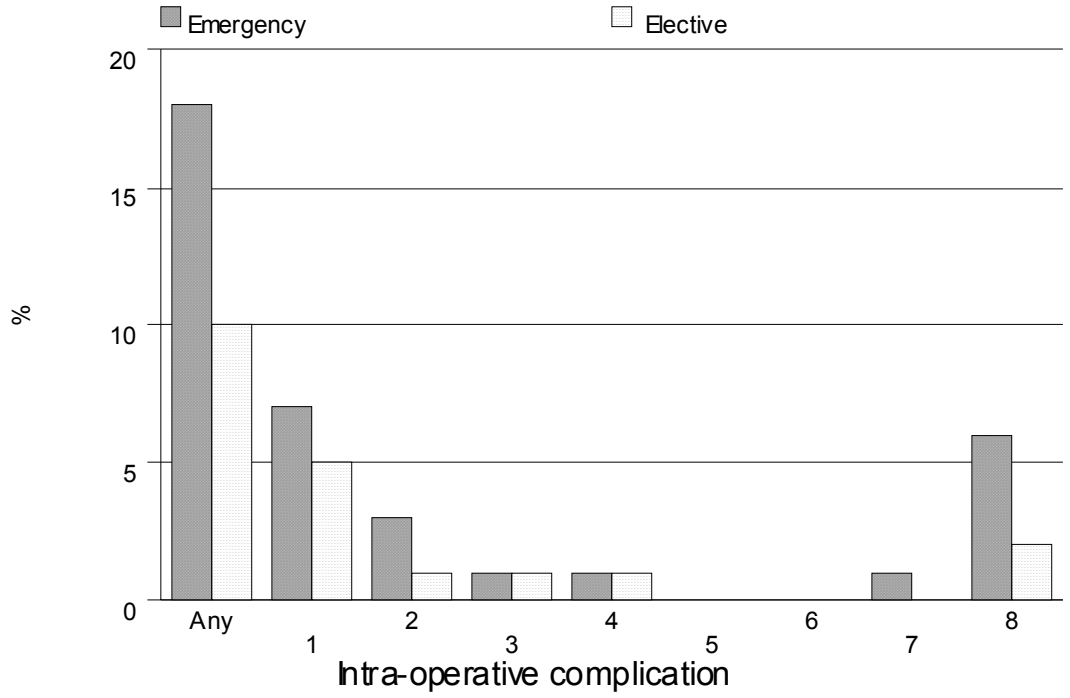
Type of intra-operative complications	Combined surgery													
	All surgeries		Any Combined surgery		Pterygium surgery		Filtering surgery		Vitreo-retinal surgery		Penetrating Keratoplasty		Other	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N	12798	100	375	100	86	100	148	100	26	100	1	100	124	100
Any intra-op complication	1328	10	64	17	7	8	20	14	9	35	1	100	31	25
1.Posterior capsule rupture with vitreous loss	584	5	33	9	2	2	9	6	5	19	1	100	17	14
2.Posterior capsule rupture without vitreous loss	189	1	2	1	1	1	2	1	0	0	0	0	0	0
3.Zonular dialysis with vitreous loss	150	1	13	3	2	2	2	1	0	0	0	0	10	8
4.Zonular dialysis without vitreous loss	96	1	5	1	0	0	3	2	1	4	0	0	1	1
5.Loss of nucleus material into vitreous	13	0	3	1	1	1	0	0	1	4	0	0	1	1
6.Choroidal/suprachoroidal haemorrhage	5	0	0	0	0	0	0	0	0	0	0	0	0	0
7.Significant trauma to cornea or iris	56	0	1	0	1	1	0	0	0	0	0	0	0	0
8.Other	274	2	12	3	2	2	5	3	3	12	0	0	3	2

Number in each column might add up to be more than that recorded at row with ‘ Any intra-operative complication’ as one patient might have more than one type of intra-operative complications

Table 3.1.3: Distribution of intra-operative complications by nature of cataract surgery

Type of intra-operative complications	Nature of cataract surgery					
	All patients		Emergency		Elective	
	No.	%	No.	%	No.	%
N	12798	100	141	100	12657	100
Any intra-op complication	1328	10	25	18	1303	10
1.Posterior capsule rupture with vitreous loss	584	5	10	7	574	5
2.Posterior capsule rupture without vitreous loss	189	1	4	3	185	1
3.Zonular dialysis with vitreous loss	150	1	1	1	149	1
4.Zonular dialysis without vitreous loss	96	1	2	1	94	1
5.Loss of nucleus material into vitreous	13	0	0	0	13	0
6.Choroidal/suprachoroidal haemorrhage	5	0	0	0	5	0
7.Significant trauma to cornea or iris	56	0	1	1	55	0
8.Other	274	2	8	6	266	2

Figure 3.1.3: Distribution of intra-operative complications by nature of cataract surgery

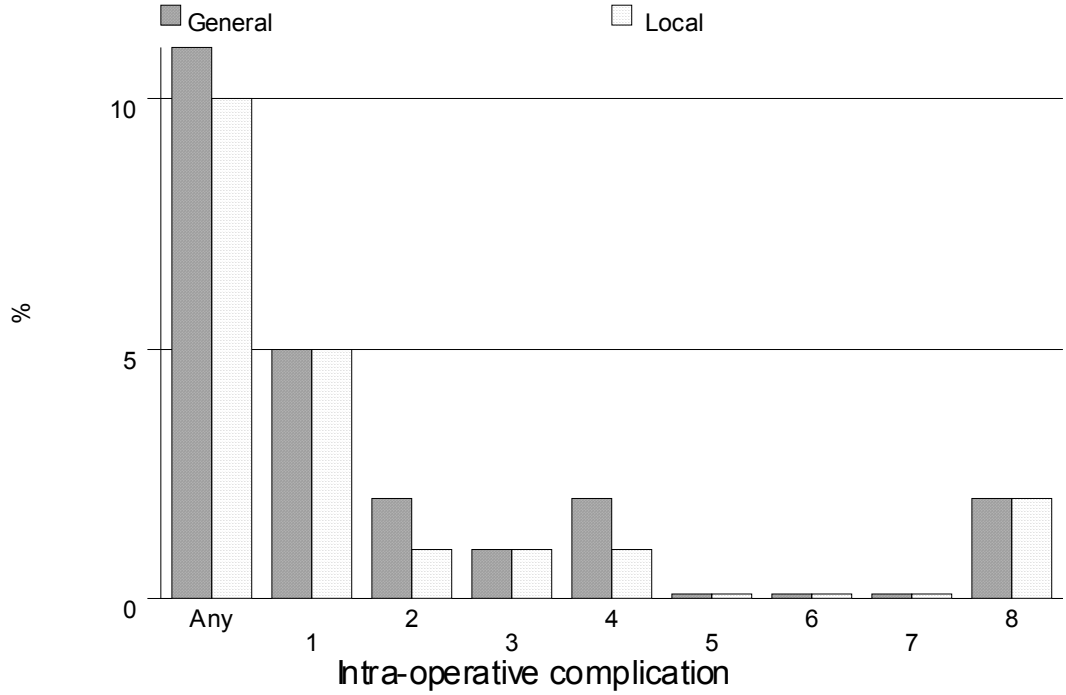


Intra-op complication: Index refers to table 3.1.03

Table 3.1.4: Distribution of intra-operative complications by type of anaesthesia

Type of intra-operative complications	Types of anaesthesia					
	All patients		General		Local	
	No.	%	No.	%	No.	%
N	12798	100	818	100	11980	100
Any intra-op complication	1328	10	88	11	1240	10
1.Posterior capsule rupture with vitreous loss	584	5	38	5	546	5
2.Posterior capsule rupture without vitreous loss	189	1	15	2	174	1
3.Zonular dialysis with vitreous loss	150	1	6	1	144	1
4.Zonular dialysis without vitreous loss	96	1	14	2	82	1
5.Loss of nucleus material into vitreous	13	0	0	0	13	0
6.Choroidal/suprachoroidal haemorrhage	5	0	0	0	5	0
7.Significant trauma to cornea or iris	56	0	1	0	55	0
8.Other	274	2	18	2	256	2

Figure 3.1.4: Distribution of intra-operative complications by type of anaesthesia



Intra-op complication: Index refers to table 3.1.4

Table 3.1.5: Distribution of intra-operative complications by type of local anaesthesia

Type of intra-op complications	Types of local anaesthesia															
	Local anaesthesia		Retrobulbar		Peribulbar		Subtenon		Sub-conjunctival		Facial block		Topical		Other	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N	11980	100	3100	100	2601	100	5647	100	28	100	1348	100	1406	100	1	100
Any intra-op complication	1240	10	226	7	262	10	730	13	0	0	103	8	104	7	0	0
1.Posterior capsule rupture with vitreous loss	546	5	110	4	106	4	309	5	0	0	61	5	61	4	0	0
2.Posterior capsule rupture without vitreous loss	174	1	30	1	32	1	108	2	0	0	14	1	18	1	0	0
3.Zonular dialysis with vitreous loss	144	1	24	1	30	1	87	2	0	0	12	1	8	1	0	0
4.Zonular dialysis without vitreous loss	82	1	22	1	18	1	43	1	0	0	3	0	5	0	0	0
5.Loss of nucleus material into vitreous	13	0	1	0	0	0	8	0	0	0	1	0	4	0	0	0
6.Choroidal/suprachoroidal haemorrhage	5	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0

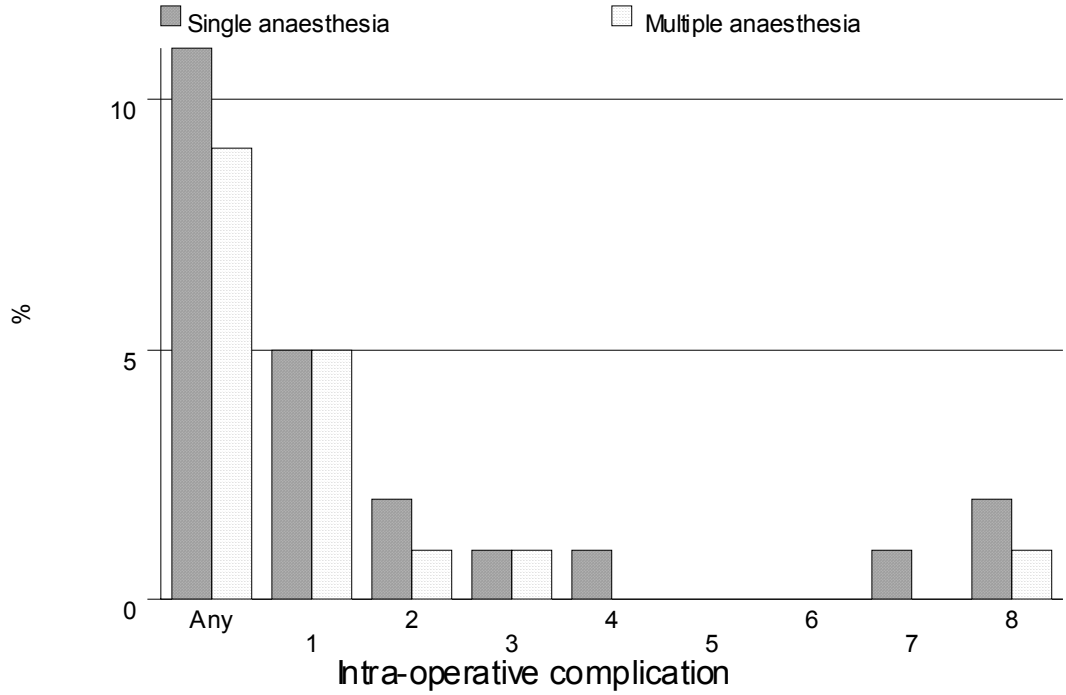
Type of intra-op complications	Types of local anaesthesia															
	Local anaesthesia		**Retrobulbar**		**Peribulbar**		**Subtenon**		**Sub-conjunctival**		**Facial block**		**Topical**		**Other**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
7.Significant trauma to cornea or iris	55	0	12	0	10	0	35	1	0	0	3	0	1	0	0	0
8.Other	256	2	34	1	72	3	155	3	0	0	11	1	12	1	0	0

* Number in each column might add up to be more than that recorded at row with ‘ Any intra-op complication’ as one patient might have more than one type of intra-operative complications

Table 3.1.6: Distribution of intra-operative complications by single or multiple local anaesthesia

Type of intra-operative complications	Local anaesthesia			
	Single		Multiple	
	No.	%	No.	%
N	9997	100	1983	100
Any intra-op complication	1067	11	173	9
1.Posterior capsule rupture with vitreous loss	452	5	94	5
2.Posterior capsule rupture without vitreous loss	150	2	24	1
3.Zonular dialysis with vitreous loss	127	1	17	1
4.Zonular dialysis without vitreous loss	73	1	9	0
5.Loss of nucleus material into vitreous	12	0	1	0
6.Choroidal/suprachoroidal haemorrhage	5	0	0	0
7.Significant trauma to cornea or iris	50	1	5	0
8.Other	228	2	28	1

Figure 3.1.6: Distribution of intra-operative complications by single or multiple local anaesthesia



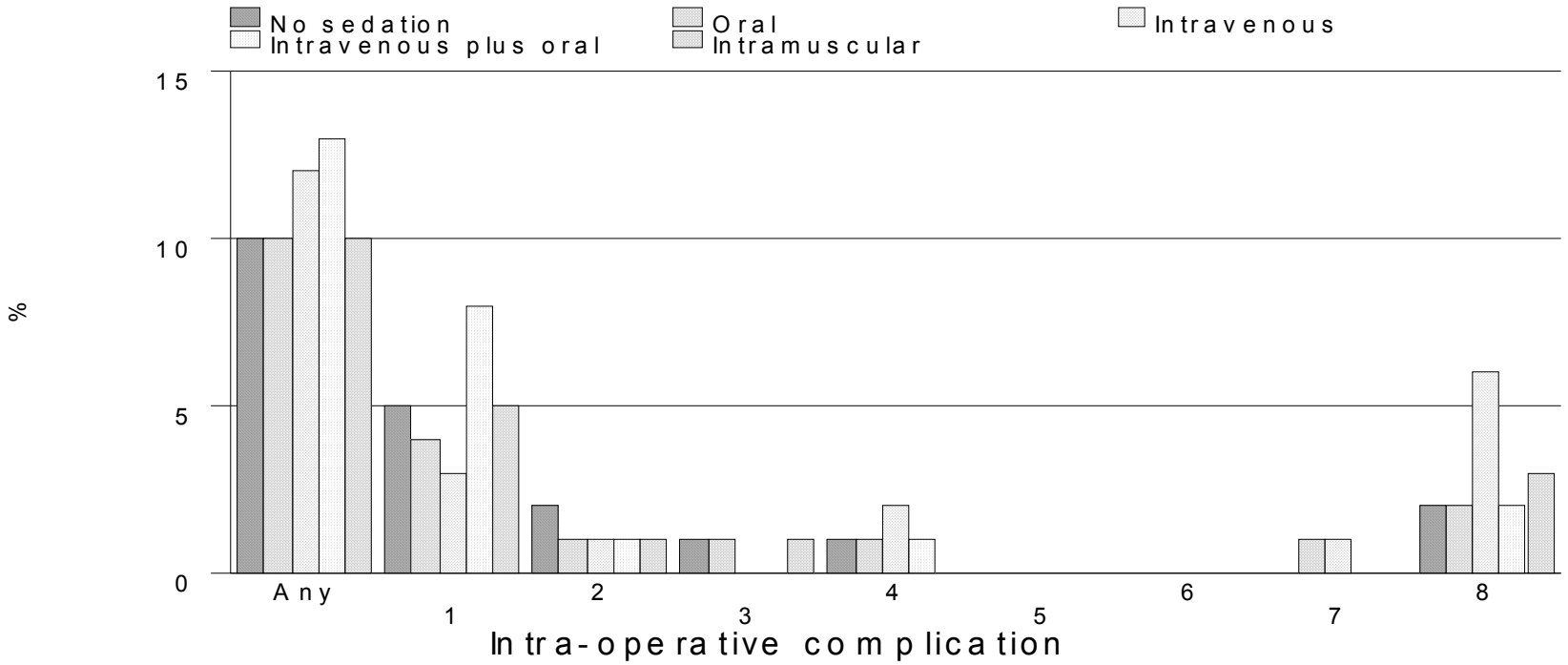
Intra-op complication: Index refers to table 3.1.06

Table 3.1.7: Distribution of intra-operative complications by type of sedation

Type of intra-operative complications	Types of sedation									
	No sedation		Oral alone		Intravenous alone		Intravenous plus oral		Intramuscular	
	No.	%	No.	%	No.	%	No.	%	No.	%
N	7507	100	3995	100	108	100	83	100	426	100
Any intra-op complication	780	10	406	10	13	12	11	13	42	10
1.Posterior capsule rupture with vitreous loss	351	5	169	4	3	3	7	8	22	5
2.Posterior capsule rupture without vitreous loss	116	2	52	1	1	1	1	1	4	1
3.Zonular dialysis with vitreous loss	87	1	53	1	0	0	0	0	5	1
4.Zonular dialysis without vitreous loss	50	1	28	1	2	2	1	1	1	0
5.Loss of nucleus material into vitreous	12	0	1	0	0	0	0	0	0	0
6.Choroidal/suprachoroidal haemorrhage	3	0	2	0	0	0	0	0	0	0
7.Significant trauma to cornea or iris	35	0	20	1	1	1	0	0	1	0
8.Other	149	2	91	2	6	6	2	2	11	3

* Number in each column might add up to be more than that recorded at row with ‘ Any intra-op complication’ as one patient might have more than one type of intra-operative complications

Figure 3.1.7: Distribution of intra-operative complications by type of sedation

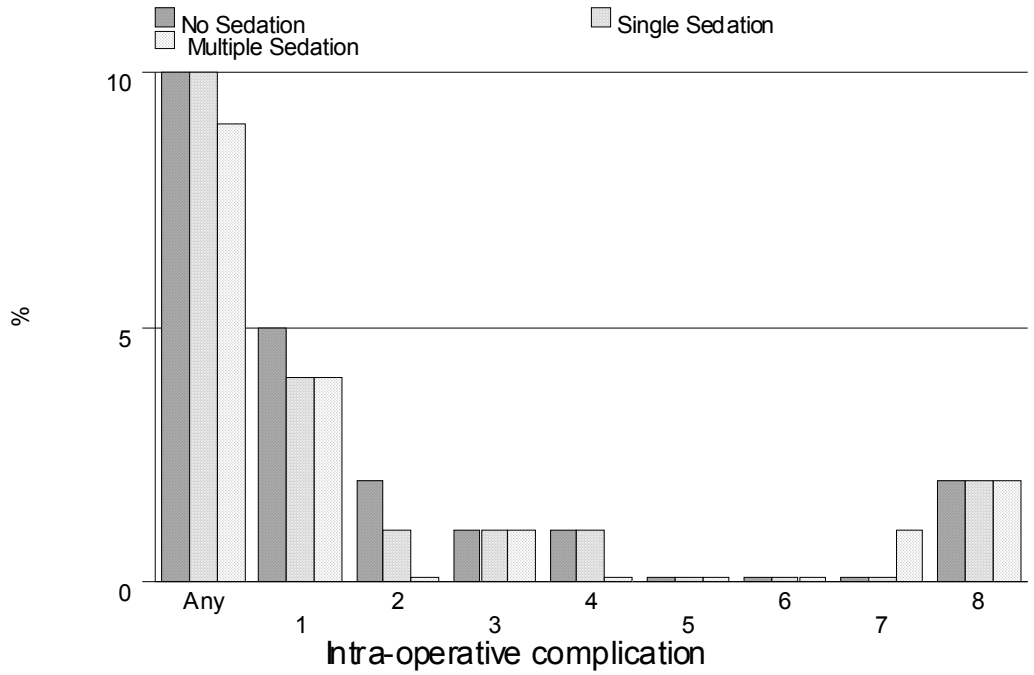


Intra-op complication: Index refers to table 3.1.7

Table 3.1.8: Distribution of intra-operative complications by sedation

Type of intra-operative complications	Sedation					
	No sedation		Single		Multiple	
	No.	%	No.	%	No.	%
N	7507	100	4334	100	139	100
Any intra-op complication	780	10	448	10	12	9
1.Posterior capsule rupture with vitreous loss	351	5	189	4	6	4
2.Posterior capsule rupture without vitreous loss	116	2	58	1	0	0
3.Zonular dialysis with vitreous loss	87	1	56	1	1	1
4.Zonular dialysis without vitreous loss	50	1	32	1	0	0
5.Loss of nucleus material into vitreous	12	0	1	0	0	0
6.Choroidal/suprachoroidal haemorrhage	3	0	2	0	0	0
7.Significant trauma to cornea or iris	35	0	18	0	2	1
8.Other	149	2	104	2	3	2

Figure 3.1.8: Distribution of intra-operative complications by sedation

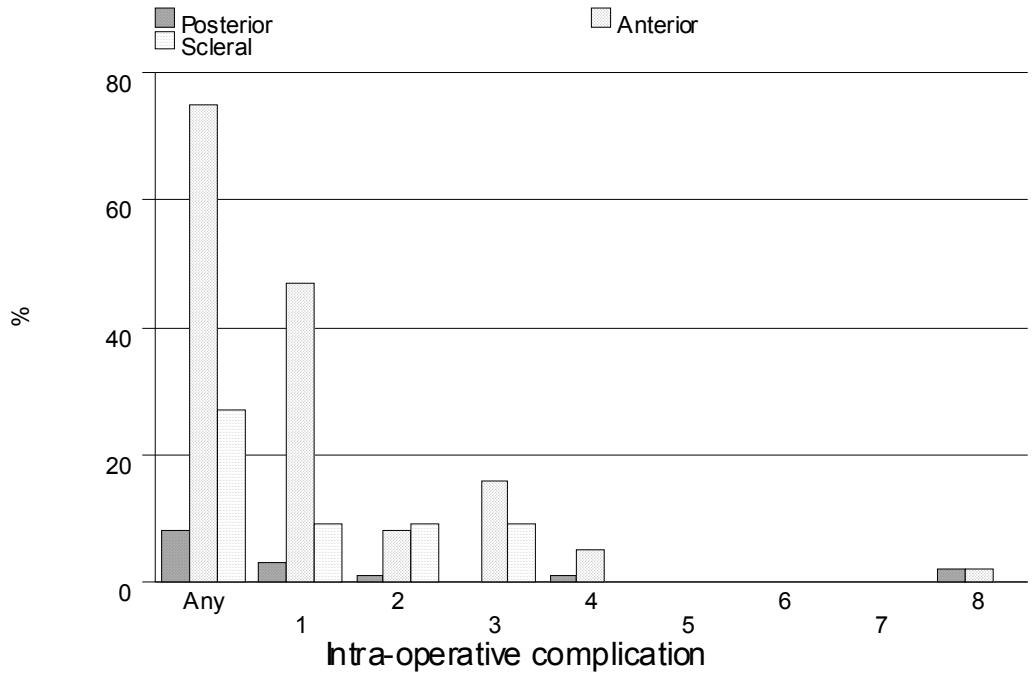


Intra-op complication: Index refers to table 3.1.8

Table 3.1.9: Distribution of intra-operative complications by cataract surgery with IOL

Type of intra-operative complications	Cataract surgery with IOL							
	All patients with IOL		Posterior chamber IOL		Anterior chamber IOL		Scleral fixated IOL	
	No.	%	No.	%	No.	%	No.	%
N	12471	100	12074	100	386	100	11	100
Any intra-op complication	1200	10	909	8	288	75	3	27
1.Posterior capsule rupture with vitreous loss	529	4	347	3	181	47	1	9
2.Posterior capsule rupture without vitreous loss	180	1	148	1	31	8	1	9
3.Zonular dialysis with vitreous loss	121	1	60	0	60	16	1	9
4.Zonular dialysis without vitreous loss	85	1	67	1	18	5	0	0
5.Loss of nucleus material into vitreous	4	0	3	0	1	0	0	0
6.Choroidal/suprachoroidal haemorrhage	1	0	1	0	0	0	0	0
7.Significant trauma to cornea or iris	53	0	53	0	0	0	0	0
8.Other	251	2	243	2	8	2	0	0

Figure 3.1.9: Distribution of intra-operative complications by cataract surgery with IOL

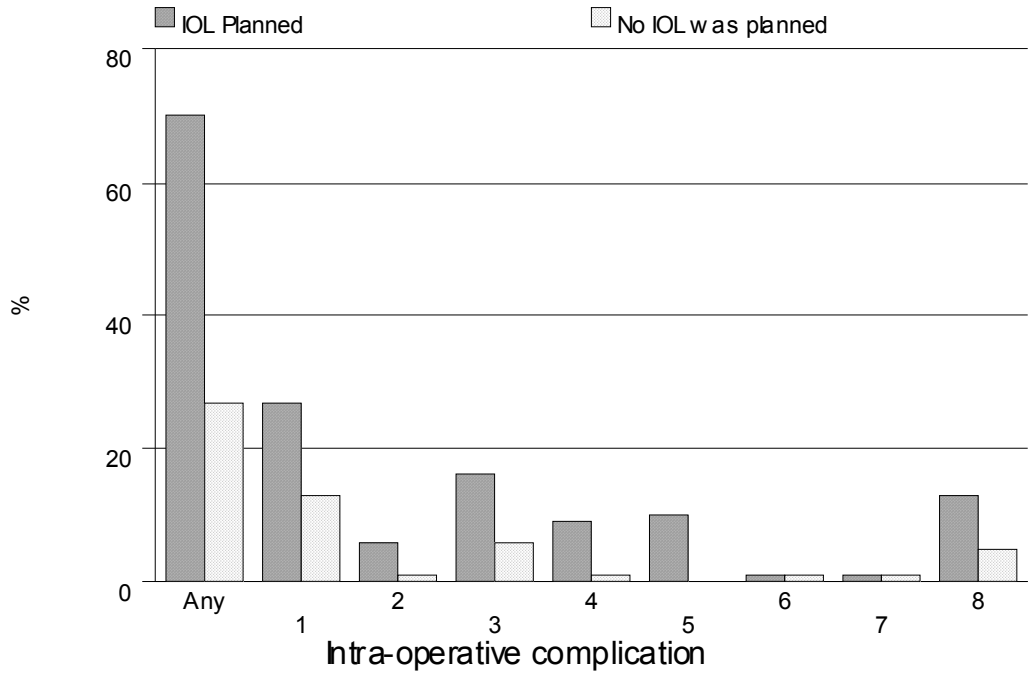


Intra-op complication: Index refers to table 3.1.09

Table 3.1.10: Distribution of intra-operative complications by cataract surgery without IOL

Type of intra-operative complications	Cataract surgery without IOL					
	All patients without IOL		IOL planned, but not implanted		No IOL was planned	
	No.	%	No.	%	No.	%
N	327	100	93	100	234	100
Any intra-op complication	128	39	65	70	63	27
1.Posterior capsule rupture with vitreous loss	55	17	25	27	30	13
2.Posterior capsule rupture without vitreous loss	9	3	6	6	3	1
3.Zonular dialysis with vitreous loss	29	9	15	16	14	6
4.Zonular dialysis without vitreous loss	11	3	8	9	3	1
5.Loss of nucleus material into vitreous	9	3	9	10	0	0
6.Choroidal/suprachoroidal haemorrhage	4	1	1	1	3	1
7.Significant trauma to cornea or iris	3	1	1	1	2	1
8.Other	23	7	12	13	11	5

Figure 3.1.10: Distribution of intra-operative complications by cataract surgery without IOL



Intra-op complication: Index refers to table 3.1.10

3.2 Cataract Surgery Complications - Post-Operative

Table 3.2.1: Distribution of post-operative complications

Post-operative complications	**No.**	**%**
N	12798	100
Patients with any post-op complication	1529	12
Patients with specific post-op complication		
1.Central edema within 4mm of visual axis	445	3
2.Raised IOP of more than 30mmHg	153	1
3.Suture abscess	59	0
4.Severe iritis with fibrin	52	0
5.Iris prolapse/wound dehiscence	32	0
6.Vitreous incarceration into wad	16	0
7.Vitreous in AC touching cornea	17	0
8.IOL decentration/dislocation	27	0
9.Cystoid macular edema	60	0
10.Endophathalmitis	25	0
11.New retinal break	0	0
12.Retinal detachment	21	0
13.Astigmation of > 3 diopters	481	4
14.Posterior capsule opacification	110	1
15.Other	213	2

Table 3.2.2: Distribution of post-operative complications by IOL types

		Type of IOL			
		Foldable		Non-Foldable	
Post-operative complications	**N**	**No.**	**%**	**No.**	**%**
N	12798	3311	100	9161	100
Patients with any post-op complication	1529	277	8	1180	13
Patients with specific post-op complication					
1.Central edema within 4mm of visual axis	445	144	4	282	3
2.Raised IOP of more than 30mmHg	153	37	1	111	1
3.Suture abscess	59	11	.3	45	.5
4.Severe iritis with fibrin	52	8	.2	42	.5
5.Iris prolapse/wound dehiscence	32	0	0	31	.3
6.Vitreous incarceration into wad	16	2	.1	12	.1
7.Vitreous in AC touching cornea	17	1	0	12	.1
8.IOL decentration/dislocation	27	2	.1	25	.3
9.Cystoid macular edema	60	13	.4	46	1
10.Endophathalmitis	25	9	.3	13	.1
11.New retinal break	0	0	0	0	0
12.Retinal detachment	21	3	.1	12	.1
13.Astigmation of > 3 diopters	481	28	1	448	5
14.Posterior capsule opacification	110	18	1	87	1
15.Other	213	34	1	148	2

Table 3.2.3: Distribution of post-operative complication by material

		Type of material							
		PMMA		Silicone		Acrylic		Other	
Post-operative complications	**N**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N	12798	9161	100	1670	100	1641	100	0	0
Patients with any post-op complication	1529	1180	13	123	7	154	9	0	0
Patients with specific post-op complication									
1.Central edema within 4mm of visual axis	445	282	3	61	4	83	5	0	0
2.Raised IOP of more than 30mmHg	153	111	1	15	1	22	1	0	0
3.Suture abscess	59	45	.5	4	.2	7	.4	0	0
4.Severe iritis with fibrin	52	42	.5	4	.2	4	.2	0	0
5.Iris prolapse/wound dehiscence	32	31	.3	0	0	0	0	0	0
6.Vitreous incarceration into wad	16	12	.1	0	0	2	.1	0	0
7.Vitreous in AC touching cornea	17	12	.1	0	0	1	.1	0	0
8.IOL decentration/dislocation	27	25	.3	1	.1	1	.1	0	0
9.Cystoid macular edema	60	46	1	4	.2	9	1	0	0
10.Endophathalmitis	25	13	.1	7	.4	2	.1	0	0
11.New retinal break	0	0	0	0	0	0	0	0	0
12.Retinal detachment	21	12	.1	2	.1	1	.1	0	0
13.Astigmation of > 3 diopters	481	448	5	10	0.6	18	1	0	0
14.Posterior capsule opacification	110	87	1	9	0.5	9	0.5	0	0
15.Other	213	148	2	19	1	15	1	0	0

Table 3.2.4: Post-operative complication by centre

		Centre											
		A		B		C		D		E		F	
Post-operative complications	**N**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N	12798	154	100	956	100	129	100	294	100	1079	100	422	100
Patients with any post-op complication	1529	35	23	191	20	5	4	30	10	112	10	112	27
Patients with specific post-op complication													
1.Central edema within 4mm of visual axis	445	19	12	22	2	1	1	0	0	50	5	70	17
2.Raised IOP of more than 30mmHg	153	2	1	11	1	1	1	0	0	13	1	12	3
3.Suture abscess	59	2	1	7	1	0	0	0	0	11	1	17	4
4.Severe iritis with fibrin	52	3	2	5	1	0	0	0	0	1	0	2	0
5.Iris prolapse/wound dehiscence	32	2	1	0	0	0	0	0	0	3	0	0	0
6.Vitreous incarceration into wad	16	0	0	1	0	0	0	0	0	3	0	0	0
7.Vitreous in AC touching cornea	17	0	0	1	0	0	0	0	0	0	0	0	0
8.IOL decentration/dislocation	27	0	0	4	0	1	1	1	0	1	0	2	0
9.Cystoid macular edema	60	5	3	0	0	0	0	5	2	0	0	1	0
10.Endophathalmitis	25	3	2	1	0	0	0	0	0	0	0	4	1
11.New retinal break	0	0	0	0	0	0	0	0	0	0	0	0	0
12.Retinal detachment	21	0	0	4	0	0	0	0	0	3	0	1	0
13.Astigmation of > 3 diopters	481	0	0	128	13	0	0	26	9	22	2	5	1
14.Posterior capsule opacification	110	0	0	14	1	0	0	0	0	3	0	5	1
15.Other	213	4	3	14	1	3	2	0	0	12	1	7	2

		Centre											
		G		H		I		J		K		L	
Post-operative complications	**N**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N	12798	737	100	1017	100	519	100	1141	100	480	100	830	100
Patients with any post-op complication	1529	15	2	59	6	19	4	124	11	45	9	186	22
Patients with specific post-op complication													
1.Central edema within 4mm of visual axis	445	1	0	14	1	5	1	18	2	24	5	29	3
2.Raised IOP of more than 30mmHg	153	2	0	7	1	1	0	15	1	2	0	15	2
3.Suture abscess	59	0	0	1	0	5	1	3	0	0	0	2	0
4.Severe iritis with fibrin	52	0	0	3	0	0	0	5	0	1	0	5	1
5.Iris prolapse/wound dehiscence	32	2	0	1	0	0	0	0	0	0	0	2	0
6.Vitreous incarceration into wad	16	0	0	0	0	0	0	2	0	0	0	3	0
7.Vitreous in AC touching cornea	17	0	0	2	0	3	1	2	0	0	0	0	0
8.IOL decentration/dislocation	27	1	0	1	0	0	0	2	0	0	0	2	0
9.Cystoid macular edema	60	1	0	12	1	1	0	8	1	1	0	14	2
10.Endophathalmitis	25	1	0	4	0	1	0	3	0	0	0	1	0
11.New retinal break	0	0	0	0	0	0	0	0	0	0	0	0	0
12.Retinal detachment	21	1	0	0	0	0	0	2	0	2	0	2	0
13.Astigmation of > 3 diopters	481	2	0	7	1	0	0	41	4	9	2	95	11
14.Posterior capsule opacification	110	2	0	2	0	1	0	3	0	3	1	10	1
15.Other	213	3	0	11	1	2	0	32	3	8	2	28	3

		Centre											
		M		**N**		**O**		**P**		**Q**		**R**	
Post-operative complications	**N**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N	12798	260	100	1009	100	414	100	429	100	188	100	392	100
Patients with any post-op complication	1529	12	5	120	12	8	2	18	4	68	36	62	16
Patients with specific post-op complication													
1.Central edema within 4mm of visual axis	445	7	3	77	8	0	0	5	1	13	7	38	10
2.Raised IOP of more than 30mmHg	153	0	0	9	1	1	0	2	0	12	6	15	4
3.Suture abscess	59	0	0	1	0	0	0	0	0	2	1	1	0
4.Severe iritis with fibrin	52	2	1	1	0	0	0	3	1	2	1	0	0
5.Iris prolapse/wound dehiscence	32	2	1	3	0	1	0	0	0	6	3	0	0
6.Vitreous incarceration into wad	16	0	0	2	0	0	0	0	0	2	1	0	0
7.Vitreous in AC touching cornea	17	0	0	0	0	0	0	0	0	7	4	0	0
8.IOL decentration/dislocation	27	0	0	1	0	0	0	0	0	3	2	1	0
9.Cystoid macular edema	60	0	0	1	0	1	0	1	0	1	1	0	0
10.Endophathalmitis	25	0	0	2	0	0	0	0	0	0	0	0	0
11.New retinal break	0	0	0	0	0	0	0	0	0	0	0	0	0
12.Retinal detachment	21	0	0	2	0	1	0	0	0	0	0	1	0
13.Astigmation of > 3 diopters	481	0	0	8	1	3	1	7	2	1	1	2	1
14.Posterior capsule opacification	110	1	0	4	0	0	0	4	1	3	2	1	0
15.Other	213	2	1	14	1	2	0	2	0	29	15	17	4

		Centre													
		S		**T**		**U**		**V**		**W**		**X**		**Y**	
Post-operative complications	**N**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N	12798	421	100	801	100	268	100	285	100	213	100	127	100	233	100
Patients with any post-op complication	1529	47	11	173	22	30	11	35	12	10	5	7	6	6	3
Patients with specific post-op complication															
1.Central edema within 4mm of visual axis	445	7	2	37	5	4	1	3	1	1	0	0	0	0	0
2.Raised IOP of more than 30mmHg	153	7	2	20	2	1	0	3	1	0	0	2	2	0	0
3.Suture abscess	59	2	0	2	0	0	0	0	0	0	0	3	2	0	0
4.Severe iritis with fibrin	52	0	0	17	2	1	0	1	0	0	0	0	0	0	0
5.Iris prolapse/wound dehiscence	32	1	0	1	0	1	0	4	1	1	0	1	1	1	0
6.Vitreous incarceration into wad	16	1	0	0	0	0	0	0	0	0	0	0	0	2	1
7.Vitreous in AC touching cornea	17	0	0	0	0	0	0	1	0	0	0	0	0	1	0
8.IOL decentration/dislocation	27	0	0	6	1	0	0	0	0	0	0	0	0	1	0
9.Cystoid macular edema	60	1	0	1	0	1	0	5	2	0	0	0	0	0	0
10.Endophathalmitis	25	1	0	2	0	0	0	0	0	1	0	0	0	1	0
11.New retinal break	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12.Retinal detachment	21	1	0	1	0	0	0	0	0	0	0	0	0	0	0
13.Astigmation of > 3 diopters	481	14	3	77	10	14	5	11	4	7	3	2	2	0	0
14.Posterior capsule opacification	110	7	2	32	4	6	2	8	3	0	0	0	0	1	0
15.Other	213	11	3	4	0	6	2	2	1	0	0	0	0	0	0

3.3 Analysis On Cataract Surgery Visual Outcome

Table 3.3.1: Median follow-up period in weeks (Patients with only unaided vision, refraction was not performed)

Type of surgery	N	Median	25th percentile	75th percentile
All surgeries	2184	7.9	2.1	11.9
Lens aspiration	81	7.6	3.3	11.3
ECCE	1309	8.1	1.9	11.9
PE	720	7	2.1	11.4
PE to ECCE	52	9.9	5.6	13.6
ICCE	14	9.1	1.9	16.6
Secondary IOL Implant	8	11.1	7.5	13.4

Table 3.3.2: Median follow-up period in weeks (Patients with refracted vision)

Type of surgery	N	Median	25th percentile	75th percentile
All surgeries	10385	11.1	8.1	13.9
Lens aspiration	237	11.1	7.9	14.1
ECCE	5492	11.7	8.6	14
PE	4309	10.3	7.4	13.4
PE to ECCE	255	12.3	9.1	14.1
ICCE	66	12.4	8.7	15.4
Secondary IOL Implant	26	11.2	8	16.9

3.4 Post-Operative Visual Acuity

Table 3.4.1: Distribution of post-operative VA

VA post operative	Unaided		Refracted	
	N=12512	100%	N=10385	100%
	No.	**%**	**No.**	**%**
6/5	9	0	60	1
6/6	598	5	2784	27
6/9	1968	16	3773	36
6/12	2294	18	1759	17
6/18	2308	18	735	7
6/24	1954	16	410	4
6/36	1452	12	279	3
6/60	868	7	166	2
5/60	77	1	13	0
4/60	64	1	13	0
3/60	127	1	43	0
2/60	128	1	59	1
1/60	146	1	54	1
CF	231	2	86	1
HM	203	2	105	1
PL	54	0	27	0
NPL	31	0	19	0

Figure 3.4.1.1: Distribution of post-operative VA

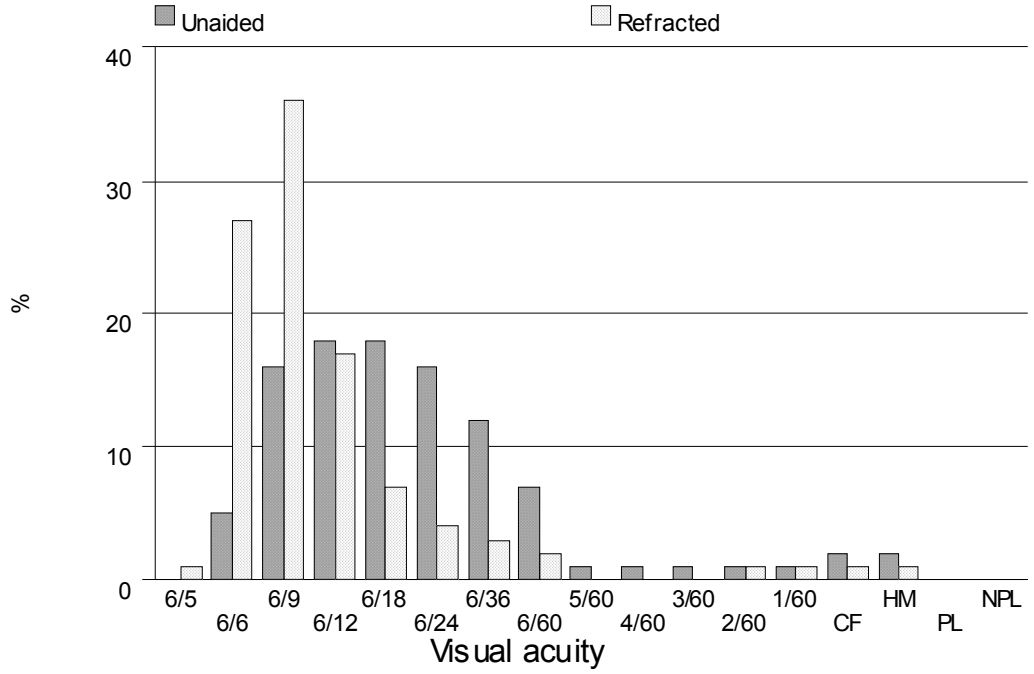


Figure 3.4.1.2: Cumulative distribution of visual acuity by pre- and post-operative unaided VA

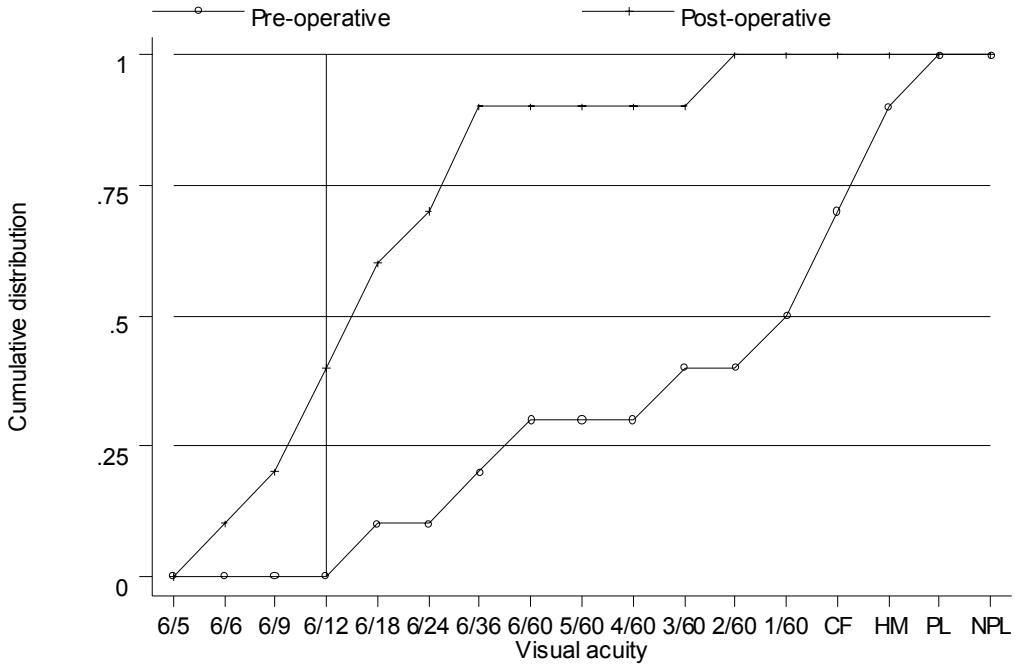


Figure 3.4.1.3: Cumulative distribution of visual acuity by pre- and post-operative refracted VA

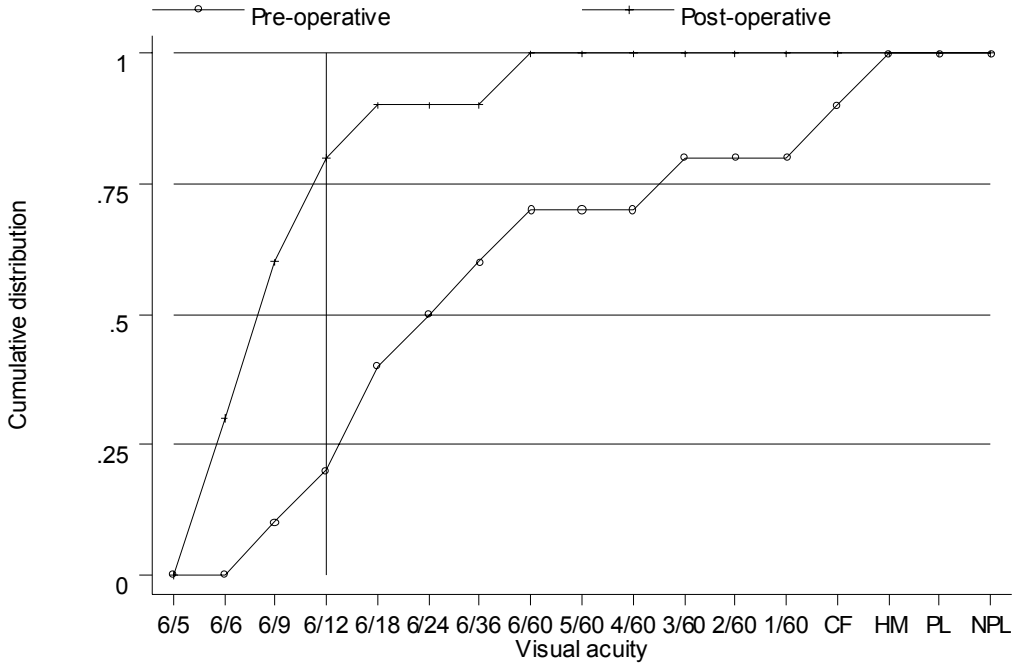
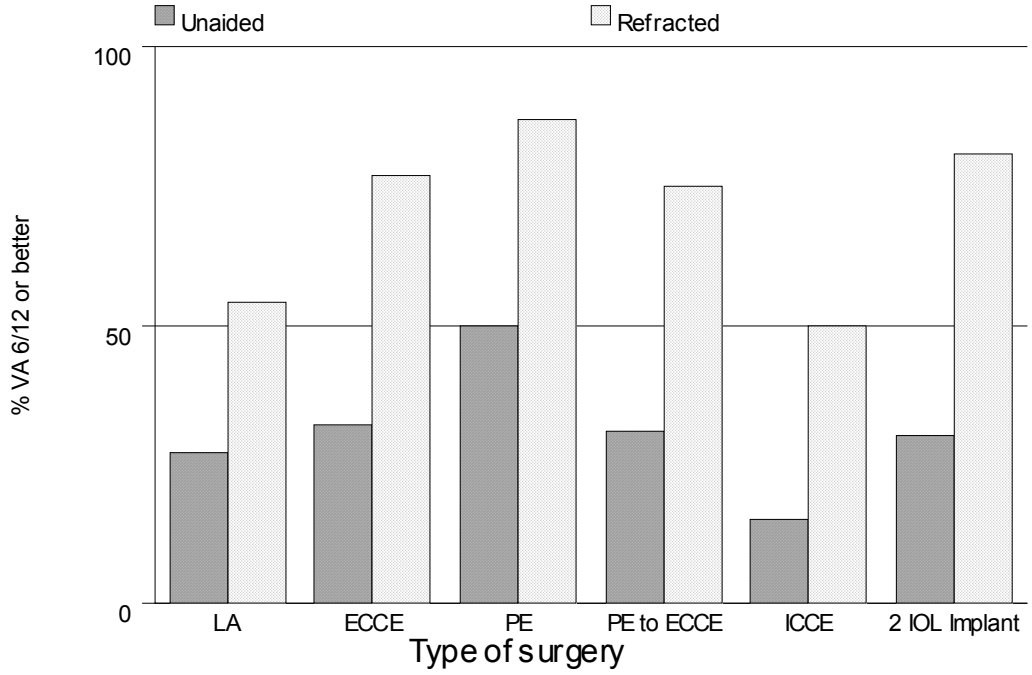


Table 3.4.2: Distribution of post-operative refracted VA 6/12 or better at the last follow up, by surgery

Type of surgery	Unaided			Refracted		
	N	VA 6/12 or better		N	VA 6/12 or better	
		No.	%		No.	%
All surgeries	12512	4869	39	10385	8376	81
Lens aspiration	315	86	27	237	129	54
ECCE	6770	2177	32	5492	4255	77
PE	5009	2490	50	4309	3746	87
PE to ECCE	305	94	31	255	192	75
ICCE	80	12	15	66	33	50
Secondary IOL Implant	33	10	30	26	21	81

Figure 3.4.2: Percent of patients with refracted VA 6/12 or better at the last follow up, by surgery



* LA=Lens aspiration

* 2 IOL Implant=Secondary IOL Implant

Table 3.4.3:Distribution of post-operative refracted VA 6/12 or better in relation to age and type of surgery

Factor	Types of cataract surgery																		
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
N	10385	8376	81	237	129	54	5492	4255	77	4309	3746	87	255	192	75	66	33	50	26	21	81
Age group, year																					
<1	2	1	50	2	1	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-14	105	51	49	97	44	45	3	2	67	4	4	100	0	0	0	0	0	0	1	1	100
15-24	80	55	69	55	33	60	12	10	83	6	6	100	0	0	0	3	2	67	4	4	100
25-34	81	60	74	35	25	71	22	16	73	23	18	78	0	0	0	0	0	0	1	1	100
35-44	303	253	83	25	14	56	151	131	87	118	102	86	5	4	80	2	1	50	2	1	50
45-54	1175	990	84	10	5	50	599	495	83	522	456	87	31	26	84	12	7	58	1	1	100
55-64	2836	2394	84	4	2	50	1446	1160	80	1283	1158	90	75	56	75	23	14	61	5	4	80
65-74	4012	3282	82	3	1	33	2183	1693	78	1692	1489	88	109	85	78	16	7	44	9	7	78
75-84	1627	1196	74	5	4	80	961	688	72	616	481	78	33	19	58	9	2	22	3	2	67
>=85	164	94	57	1	0	0	115	60	52	45	32	71	2	2	100	1	0	0	0	0	0

Table 3.4.4: Distribution of post-operative refracted VA 6/12 or better in relation to gender and type of surgery

Factor	Types of cataract surgery																		
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
N	10385	8376	81	237	129	54	5492	4255	77	4309	3746	87	255	192	75	66	33	50	26	21	81
Gender																					
Male	5046	4105	81	157	87	55	2602	2048	79	2093	1825	87	130	104	80	49	27	55	15	14	93
Female	5339	4271	80	80	42	53	2890	2207	76	2216	1921	87	125	88	70	17	6	35	11	7	64

Table 3.4.5: Distribution of post-operative refracted VA 6/12 or better in relation to co-morbidity and type of surgery

Factor	Types of cataract surgery																		
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
N	10385	8376	81	237	129	54	5492	4255	77	4309	3746	87	255	192	75	66	33	50	26	21	81
Co-morbidity																					
1. Ocular																					
Yes	2920	1951	67	81	36	44	1682	1081	64	1037	768	74	60	38	63	50	21	42	10	7	70
No	7465	6425	86	156	93	60	3810	3174	83	3272	2978	91	195	154	79	16	12	75	16	14	88
2. Systemic																					
Yes	5900	4776	81	28	18	64	3095	2387	77	2582	2234	87	169	123	73	20	10	50	6	4	67
No	4485	3600	80	209	111	53	2397	1868	78	1727	1512	88	86	69	80	46	23	50	20	17	85

Table 3.4.6: Distribution of post-operative refracted VA 6/12 or better in relation to complication and type of surgery

Factor	Types of cataract surgery																		
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
N	10385	8376	81	237	129	54	5492	4255	77	4309	3746	87	255	192	75	66	33	50	26	21	81
Complication																					
1. Intra-op																					
Yes	1091	740	68	37	16	43	548	350	64	377	289	77	107	76	71	22	9	41	0	0	0
No	9294	7636	82	200	113	56	4944	3905	79	3932	3457	88	148	116	78	44	24	55	26	21	81
2. Post-op																					
Yes	1288	845	66	33	10	30	810	529	65	376	273	73	47	25	53	15	1	7	7	7	100
No	9097	7531	83	204	119	58	4682	3726	80	3933	3473	88	208	167	80	51	32	63	19	14	74

Table 3.4.7: Distribution of post-operative refracted VA 6/12 or better in relation to nature of surgery and type of surgery

Factor	Types of cataract surgery																			
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
N	10385	8376	81	237	129	54	5492	4255	77	4309	3746	87	255	192	75	66	33	50	26	21	81
Nature of surgeries																					
Emergency	108	74	69	12	5	42	56	39	70	36	28	78	1	0	0	3	2	67	0	0	0
Elective	10277	8302	81	225	124	55	5436	4216	78	4273	3718	87	254	192	76	63	31	49	26	21	81

Table 3.4.8: Distribution of post-operative refracted VA 6/12 or better in relation to anaesthesia and type of surgery

Factor	Types of cataract surgery																			
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
N	10385	8376	81	237	129	54	5492	4255	77	4309	3746	87	255	192	75	66	33	50	26	21	81
Anaesthesia																					
1. Anaesthesia																					
General	571	353	62	200	110	55	208	131	63	131	92	70	9	3	33	13	8	62	10	9	90
Local	9814	8023	82	37	19	51	5284	4124	78	4178	3654	87	246	189	77	53	25	47	16	12	75
2. Local anaesthesia																					
Retrobulbar	2368	1927	81	5	2	40	1266	988	78	1025	887	87	52	38	73	12	5	42	8	7	88
Peribulbar	2051	1678	82	7	5	71	1168	921	79	816	712	87	40	29	73	17	9	53	3	2	67
Subtenon	4780	3865	81	22	11	50	2904	2266	78	1683	1462	87	139	110	79	27	13	48	5	3	60
Subconjunctival	26	19	73	0	0	0	13	8	62	12	10	83	1	1	100	0	0	0	0	0	0
Facialblock	991	788	80	2	1	50	648	496	77	317	275	87	17	9	53	4	4	100	3	3	100
Topical	1208	1031	85	6	2	33	171	115	67	1003	894	89	25	19	76	2	1	50	1	0	0
Other	1	1	100	0	0	0	1	1	100	0	0	0	0	0	0	0	0	0	0	0	0
3. Sedation																					
Any	3603	2964	82	11	5	45	2235	1788	80	1252	1097	88	80	61	76	21	9	43	4	4	100
None	6782	5412	80	226	124	55	3257	2467	76	3057	2649	87	175	131	75	45	24	53	22	17	77

Table 3.4.9: Distribution of post-operative refracted VA 6/12 or better in relation to combined surgery and type of surgery

Factor	Types of cataract surgery																		
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
N	10385	8376	81	237	129	54	5492	4255	77	4309	3746	87	255	192	75	66	33	50	26	21	81
Combined surgery																					
Any	281	179	64	23	8	35	135	86	64	99	71	72	4	2	50	16	9	56	4	3	75
None	10104	8197	81	214	121	57	5357	4169	78	4210	3675	87	251	190	76	50	24	48	22	18	82

Table 3.4.10: Distribution of post-operative refracted VA 6/12 or better in relation to IOL and type of surgery

Factor	Types of cataract surgery																		
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
N	10385	8376	81	237	129	54	5492	4255	77	4309	3746	87	255	192	75	66	33	50	26	21	81
IOL																					
1. IOL																					
With IOL	10184	8329	82	207	121	58	5370	4227	79	4291	3744	87	249	192	77	41	24	59	26	21	81
Without IOL	201	47	23	30	8	27	122	28	23	18	2	11	6	0	0	25	9	36	0	0	0
N	10185	8330	82	207	121	58	5370	4227	79	4292	3745	87	249	192	77	41	24	59	26	21	81
2. IOL-type																					
Foldable	2871	2535	88	64	41	64	148	115	78	2604	2330	89	53	47	89	0	0	0	2	2	100
Non-foldable	7314	5795	79	143	80	56	5222	4112	79	1688	1415	84	196	145	74	41	24	59	24	19	79
3.IOL-material																					
PMMA	7314	5795	79	143	80	56	5222	4112	79	1688	1415	84	196	145	74	41	24	59	24	19	79
Silicone	1495	1335	89	15	11	73	55	42	76	1403	1262	90	21	19	90	0	0	0	1	1	100
Acrylic	1376	1200	87	49	30	61	93	73	78	1201	1068	89	32	28	88	0	0	0	1	1	100
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.4.11: Distribution of post-operative refracted VA 6/12 or better in relation to surgeon status and type of surgery without ocular co-morbidity

Factor	Types of cataract surgery																			
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	% (95% CI)	N	No.	%	N	No.	% (95% CI)	N	No.	% (95% CI)	N	No.	%	N	No.	%	N	No.	%
N	7465	6425	86 (0.85, 0.87)	156	93	60	3810	3174	83 (0.82, 0.84)	3272	2978	91 (0.90, 0.92)	195	154	79	16	12	75	16	14	88
Surgeon status																					
Specialist	4996	4328	87 (0.86, 0.88)	111	61	55	1834	1511	82 (0.81, 0.84)	2867	2611	91 (0.90, 0.92)	164	129	79	9	7	78	11	9	82
Gazetting specialist	1091	934	86 (0.83, 0.88)	33	21	64	707	600	85 (0.82, 0.87)	320	287	90 (0.86, 0.93)	22	19	86	4	2	50	5	5	100
Medical officer	1378	1163	84 (0.82, 0.86)	12	11	92	1269	1063	84 (0.82, 0.86)	85	80	94 (0.87, 0.98)	9	6	67	3	3	100	0	0	0

Table 3.4.12: Distribution of post-operative refracted VA 6/12 or better in relation to centre and type of surgery

Factor	Types of cataract surgery																		
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
N	10385	8376	81	237	129	54	5492	4255	77	4309	3746	87	255	192	75	66	33	50	26	21	81
Centre																					
A	12	9	75	0	0	0	6	4	67	6	5	83	0	0	0	0	0	0	0	0	0
B	799	666	83	7	4	57	530	430	81	240	213	89	13	11	85	5	4	80	4	4	100
C	56	39	70	5	2	40	51	37	73	0	0	0	0	0	0	0	0	0	0	0	0
D	179	135	75	5	2	40	159	120	75	13	12	92	2	1	50	0	0	0	0	0	0
E	864	726	84	17	10	59	397	319	80	417	370	89	26	21	81	5	4	80	2	2	100
F	377	301	80	22	12	55	194	145	75	151	136	90	7	6	86	2	1	50	1	1	100
G	532	419	79	12	8	67	146	93	64	364	312	86	3	3	100	4	2	50	3	1	33
H	906	732	81	17	8	47	310	230	74	543	471	87	30	21	70	6	2	33	0	0	0
I	398	326	82	7	3	43	171	138	81	206	175	85	13	10	77	0	0	0	1	0	0
J	1092	825	76	27	15	56	528	379	72	498	404	81	31	22	71	7	4	57	1	1	100
K	312	216	69	12	6	50	117	65	56	171	139	81	7	2	29	2	2	100	3	2	67
L	748	649	87	15	8	53	538	466	87	161	154	96	21	13	62	12	7	58	1	1	100
M	55	45	82	0	0	0	55	45	82	0	0	0	0	0	0	0	0	0	0	0	0
N	938	760	81	20	9	45	414	319	77	487	423	87	9	7	78	6	1	17	2	1	50
O	194	134	69	11	6	55	117	75	64	61	49	80	4	3	75	0	0	0	1	1	100
P	385	339	88	7	4	57	213	181	85	138	130	94	27	24	89	0	0	0	0	0	0
Q	185	140	76	2	0	0	181	139	77	1	1	100	1	0	0	0	0	0	0	0	0
R	350	264	75	2	1	50	149	85	57	194	177	91	0	0	0	5	1	20	0	0	0
S	330	271	82	7	3	43	141	117	83	162	136	84	15	11	73	2	1	50	3	3	100
T	673	561	83	21	14	67	372	296	80	257	233	91	18	15	83	3	1	33	2	2	100
U	190	160	84	10	5	50	163	139	85	7	7	100	8	7	88	1	1	100	1	1	100
V	280	224	80	8	6	75	178	141	79	82	67	82	9	8	89	3	2	67	0	0	0
W	211	177	84	0	0	0	161	134	83	43	40	93	5	3	60	2	0	0	0	0	0

Factor	Types of cataract surgery																		
	All surgeries			Lens aspiration			ECCE			PE			PE to ECCE			ICCE			Secondary IOL Implant		
	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%	N	No.	%
X	125	109	87	0	0	0	97	84	87	26	23	88	2	2	100	0	0	0	0	0	0
Y	194	149	77	3	3	100	104	74	71	81	69	85	4	2	50	1	0	0	1	1	100

3.5 Post-Operative Refracted VA Improved by One or More Line of Snellen Chart

Table 3.5.1: Distribution of post-operative refracted VA improved by one or more line of Snellen chart, at the last follow up

Type of surgery		Refracted Visual Acuity					
	N	No change		Worse		Improved	
		No.	%	No.	%	No.	%
All surgeries	628	41	7	27	4	560	89
Lens aspiration	14	0	0	1	7	13	93
ECCE	235	9	4	9	4	217	92
PE	350	29	8	14	4	307	88
PE to ECCE	24	2	8	3	13	19	79
ICCE	2	0	0	0	0	2	100
Secondary IOL Implant	3	1	33	0	0	2	67

Table 3.5.2: Distribution of post- operative refracted VA improved by one or more line of Snellen chart, with and without ocular co-morbidity at the last follow up

Ocular co-morbidity	Refracted VA		Type of surgery						
			All surgeries	Lens aspiration	ECCE	PE	PE to ECCE	ICCE	Secondary IOL Implant
Yes	N		156	2	68	77	5	2	2
	No change	No.	9	0	4	4	0	0	1
		%	6	0	6	5	0	0	50
	Worse	No.	12	0	5	7	0	0	0
		%	8	0	7	9	0	0	0
	Improved	No.	135	2	59	66	5	2	1
		%	87	100	87	86	100	100	50
No.	N		472	12	167	273	19	0	1
	No change	No.	32	0	5	25	2	0	0
		%	7	0	3	9	11	0	0
	Worse	No.	15	1	4	7	3	0	0
		%	3	8	2	3	16	0	0
	Improved	No.	425	11	158	241	14	0	1
		%	90	92	95	88	74	0	100

Table 3.5.3: Distribution of post- operative refracted VA improved by one or more line of Snellen chart with intra-op complication and without intra-op complication, at the last follow up

Intra-op complication	Refracted VA		Type of surgery						
			All surgeries	**Lens aspiration**	**ECCE**	**PE**	**PE to ECCE**	**ICCE**	**Secondary IOL Implant**
Yes	N		77	1	25	33	17	1	0
	No change	No.	6	0	1	3	2	0	0
		%	8	0	4	9	12	0	0
	Worse	No.	6	0	1	2	3	0	0
		%	8	0	4	6	18	0	0
	Improved	No.	65	1	23	28	12	1	0
		%	84	100	92	85	71	100	0
No.	N		551	13	210	317	7	1	3
	No change	No.	35	0	8	26	0	0	1
		%	6	0	4	8	0	0	33
	Worse	No.	21	1	8	12	0	0	0
		%	4	8	4	4	0	0	0
	Improved	No.	495	12	194	279	7	1	2
		%	90	92	92	88	100	100	67

Table 3.5.4: Distribution of post -operative refracted VA improved by one or more line of Snellen chart with systemic co-morbidity and without systemic co-morbidity, at the last follow up

Systemic co-morbidity	Refracted VA		Type of surgery						
			All surgeries	Lens aspiration	ECCE	PE	PE to ECCE	ICCE	Secondary IOL Implant
Yes	N		407	1	155	233	17	1	0
	No change	No.	29	0	4	23	2	0	0
		%	7	0	3	10	12	0	0
	Worse	No.	22	0	9	11	2	0	0
		%	5	0	6	5	12	0	0
	Improved	No.	356	1	142	199	13	1	0
		%	87	100	92	85	76	100	0
No.	N		221	13	80	117	7	1	3
	No change	No.	12	0	5	6	0	0	1
		%	5	0	6	5	0	0	33
	Worse	No.	5	1	0	3	1	0	0
		%	2	8	0	3	14	0	0
	Improved	No.	204	12	75	108	6	1	2
		%	92	92	94	92	86	100	67

Table 3.5.5: Distribution of post -operative refracted VA improved by one or more line of Snellen chart at the last follow up in relation to surgeon status and type of surgery without ocular comorbidity

Type of surgery	Surgeon status	N	No change		Worse		Improved	
			No.	% (95%CI)	No.	% (95%CI)	No.	% (95%CI)
All surgeries	Specialist	374	27	7 (4.81,10.33)	13	3 (1.86,5.87)	334	89 (85.72,92.25)
	Gazetting specialist	55	7	13 (5.27,24.48)	0	0 (0.00,6.49)*	48	87 (75.52,94.73)
	Medical officer	62	1	2 (0.04,8.66)	2	3 (0.39,11.17)	59	95 (86.50,98.99)
Lens aspiration	Specialist	8	0	0	1	13	7	88
	Gazetting specialist	1	0	0	0	0	1	100
	Medical officer	3	0	0	0	0	3	100
ECCE	Specialist	109	3	3 (0.57,7.83)	2	2 (0.22,6.47)	104	95 (89.62,98.49)
	Gazetting specialist	27	4	15 (4.19,33.73)	0	0 (0.00,12.77)*	23	85 (66.27,95.81)
	Medical officer	41	1	2 (0.06,12.86)	2	5 (0.60,16.53)	38	93 (80.08,98.47)
PE	Specialist	240	23	10 (6.17,14.03)	7	3 (1.18,5.92)	210	88 (82.64,91.41)
	Gazetting specialist	23	2	9 (1.07,28.04)	0	0 (0.00,14.82)*	21	91 (71.96,98.93)
	Medical officer	17	0	0 (0.00,19.51)*	0	0 (0.00,19.51)*	17	100 (80.49,100.00)*
PE to ECCE	Specialist	17	1	6	3	18	13	76
	Gazetting specialist	3	1	33	0	0	2	67

Type of surgery	Surgeon status	N	No change		Worse		Improved	
			No.	% (95%CI)	No.	% (95%CI)	No.	% (95%CI)
	Medical officer	1	0	0	0	0	1	100
ICCE	Specialist	0	0		0		0	
	Gazetting specialist	0	0		0		0	
	Medical officer	0	0		0		0	
Secondary IOL Implant	Specialist	0	0		0		0	
	Gazetting specialist	1	0	0	0	0	1	100
	Medical officer	0	0		0		0	

*one-sided, 97.5% confidence interval

3.6 Factors Contributing to Post-Operative Refracted Visual Acuity of Worse than 6/12

Table 3.6.1: Distribution of factors contributing to post- operative refracted VA of worse than 6/12

Factor	No.	%
N	2009	100
Patients with any factor	1776	88
Patients with specific factor		
1.High astigmatism	489	24
2.Posterior capsular opacity	198	10
3.Cystoid macular edema	93	5
4.Endophthalmitis	16	1
5.Corneal decompensation	37	2
6.Decentre ed IOL	14	1
7.Retinal detachment	27	1
8.Preexisting ocular co-morbidity	818	41
9.Other	302	15

APPENDIX I (CLINICAL RECORD FORMS)

PRE-CLERKING RECORD

OPERATIVE RECORD

CATARACT SURGERY OUTCOMES THROUGH 12 WEEKS POST OP

PRE-CLERKING RECORD

Hospital / Clinic : _____

Date (dd/mm/yy) | | | |

Office use: /

Centre:

SECTION 1 : PATIENT PARTICULARS

Name: _____

IC (old): _____ (new): _____

Address: _____

Postcode: _____ Town/City: _____ State: _____

Homephone: _____ Workphone: _____ Ext: _____ Hand-phone: _____

Age (in years): ☐

Gender:
- ☐ Male
- ☐ Female

Ethnic group:
- ☐ Malay ☐ Orang Asli ☐ Murut ☐ Iban
- ☐ Chinese ☐ Melanau ☐ Bajau ☐ Other, specify: _____
- ☐ Indian ☐ Kadazan ☐ Bidayuh

SECTION 2 : MEDICAL HISTORY

(check ☑ one box as appropriate)

Surgery On:
- ☐ First eye ☐ Second eye

↓

If Second eye:

Date of first surgery : _____

Intra-op complication : ☐ Yes ☐ No

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

Cause Of Cataract

☐ Primary **OR** ☐ Secondary

If primary:
- ☐ Senile/age related
- ☐ Congenital
- ☐ Developmental
- ☐ Other _____

If secondary:
- ☐ Trauma
- ☐ Drug Induced
- ☐ Surgery Induced
- ☐ Other _____

Ocular Comorbidity *(check ☑ one or more boxes below if present)*

☐ NONE

ANTERIOR SEGMENT:
- ☐ Pterygim involving the cornea
- ☐ Corneal Opacity
- ☐ Glaucoma
- ☐ Chronic Uveitis
- ☐ Pseudoexfoliation

Lens Related Complication
- ☐ Phacomorphic
- ☐ Phacolytic
- ☐ Subluxated / Dislocated

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

POSTERIOR SEGMENT:

Diabetic Retinopathy
- ☐ Non Proliferative
- ☐ Proliferative
- ☐ CSME
- ☐ Vitreous haemorrhage

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

☐ **Other ocular comorbidity, specify:**

_____

_____

Systemic Comorbidity

(check ☑ one or more boxes below if present)
- ☐ None
- ☐ Hypertension
- ☐ Diabetes Mellitus
- ☐ Ischaemic Heart Disease
- ☐ Renal Failure
- ☐ Cerebrovascular accident
- ☐ COAD / Asthma
- ☐ Hansen's Disease
- ☐ Allergies
- ☐ Other, specify: _____

_____

_____

_____

_____

_____

SECTION 3 : VISUAL ACUITY MEASUREMENT

Vision	Right	Left
Presenting Visual Acuity (with / without glasses):		
Pin Hole Visual Acuity (with / without glasses):		
Refracted Visual Acuity		

PRE-CLERKING RECORD

Hospital / Clinic : _____

Date (dd/mm/yy) | | | |

Office use: /

Centre:

SECTION 1 : PATIENT PARTICULARS

Name: _____

IC (old): _____ (new): _____

Address: _____

Postcode: _____ Town/City: _____ State: _____

Homephone: _____ Workphone: _____ Ext: _____ Hand-phone: _____

Age (in years): ☐

Gender:
- ☐ Male
- ☐ Female

Ethnic group:
- ☐ Malay ☐ Orang Asli ☐ Murut ☐ Iban
- ☐ Chinese ☐ Melanau ☐ Bajau ☐ Other, specify: _____
- ☐ Indian ☐ Kadazan ☐ Bidayuh

SECTION 2 : MEDICAL HISTORY

(check ☑ one box as appropriate)

Surgery On:
- ☐ First eye ☐ Second eye

↓

If Second eye:

Date of first surgery : _____

Intra-op complication : ☐ Yes ☐ No

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

Cause Of Cataract

☐ Primary **OR** ☐ Secondary

If primary:
- ☐ Senile/age related
- ☐ Congenital
- ☐ Developmental
- ☐ Other _____

If secondary:
- ☐ Trauma
- ☐ Drug Induced
- ☐ Surgery Induced
- ☐ Other _____

Ocular Comorbidity *(check ☑ one or more boxes below if present)*

☐ NONE

ANTERIOR SEGMENT:
- ☐ Pterygim involving the cornea
- ☐ Corneal Opacity
- ☐ Glaucoma
- ☐ Chronic Uveitis
- ☐ Pseudoexfoliation

Lens Related Complication
- ☐ Phacomorphic
- ☐ Phacolytic
- ☐ Subluxated / Dislocated

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

POSTERIOR SEGMENT:

Diabetic Retinopathy
- ☐ Non Proliferative
- ☐ Proliferative
- ☐ CSME
- ☐ Vitreous haemorrhage

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

☐ **Other ocular comorbidity, specify:**

_____

_____

Systemic Comorbidity

(check ☑ one or more boxes below if present)
- ☐ None
- ☐ Hypertension
- ☐ Diabetes Mellitus
- ☐ Ischaemic Heart Disease
- ☐ Renal Failure
- ☐ Cerebrovascular accident
- ☐ COAD / Asthma
- ☐ Hansen's Disease
- ☐ Allergies
- ☐ Other, specify: _____

_____

_____

_____

_____

_____

SECTION 3 : VISUAL ACUITY MEASUREMENT

Vision	Right	Left
Presenting Visual Acuity (with / without glasses):		
Pin Hole Visual Acuity (with / without glasses):		
Refracted Visual Acuity		

OPERATIVE RECORD

Hospital / Clinic : _____

Patient Name : _____

I/C No. (old) : _____ (new) : _____

Office use: ____ / ____

Centre: ____

SECTION 1 : OPERATIVE DATA

1. Name of Surgeon : _____
   Surgeon status ☐ Specialist ☐ Gazetting specialist ☐ Medical officer
2. Name of Assistant : _____
3. Name of Scrub Nurse: _____
4. Name of Anaesthetist: _____
5. Date Of Cataract Operation (dd/mm/yy): ____
6. Time: Start: ____ hours End: ____ hours
7. Pre-op Diagnosis : _____
8. Post-op Diagnosis : _____
9. Type of Admission : ☐ Day Care ☐ Not Day Care

SURGERY

10. Urgency of operation:

☐ Elective ☐ Emergency

11. Operative Eye:

☐ Right ☐ Left

12. Type:

☐ Lens aspiration
☐ ECCE
☐ Phaco
☐ Phaco converted to ECCE
☐ ICCE
☐ Secondary IOL Implant

13. Combined:

(check ☑ one or more boxes below if perform)

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

ANAESTHESIA

14. Type of Anaesthesia:

☐ General
☐ Local

↓ If local

(check ☑ one or more boxes below)

Type:

☐ retrobulbar
☐ penbulbar
☐ subtenon
☐ subconjunctival
☐ facial block
☐ topical

Type of sedation:

☐ None
☐ Oral
☐ Intravenous
☐ Intramuscular

IOL

15. 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: _____

16. Material:

☐ PMMA ☐ Other, specify
☐ Silicone _____
☐ Acrylic _____

17. Type:

☐ Foldable
☐ Non-Foldable

19. Brand:

☐ Alcon ☐ Other, specify
☐ Allergan _____
☐ Pharmacia _____
☐ Corneal _____
☐ Storz _____

VISCOELASTIC MATERIAL

19. Viscoelastic Material

(check ☑ one or more boxes below)

☐ Healon plain
☐ Healon GV
☐ Healon 5
☐ Viscoat
☐ Provisc
☐ Duovisc
☐ Other, specify: _____

SECTION 2 : FINDINGS

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

☐ None
☐ Posterior capsule rupture with vitreous loss
☐ Posterior capsule rupture without vitreous loss
☐ Zonular dialysis with vitreous loss
☐ Zonular dialysis without vitreous loss
☐ Loss of nucleus material into vitreous
☐ Choroidal / suprachoroidal haemorrhage
☐ Significant trauma to cornea or iris

Other, specify: _____

Finding Details *(Optional)*

(Description on preexisting abnormal ocular conditions and intraoperative complications, if any. May include drawings.)

IOL Sticker:

CATARACT SURGERY OUTCOMES THROUGH 12 WEEKS POST-OP

Hospital / Clinic: _____

Patient Name : _____

I/C No. (old) : _____ (new) _____

Date of Cataract Operation _____

Office use: ____ / ____

Centre: ____

SECTION 1 : POST-OP COMPLICATIONS

(check ☑ if any of the complications is noted during the first 12 weeks post-operative period)

- ☐ Central cornea edema within 4mm of visual axis
- ☐ Raised IOP of more than 30 mmHg
- ☐ Suture abscess
- ☐ Severe iritis with fibrin
- ☐ Iris prolapse / wound dehiscence
- ☐ Vitreous incarceration into wound
- ☐ Vitreous in AC touching cornea
- ☐ IOL decentration / dislocation
- ☐ Cystoid macular edema
- ☐ Endophthalmitis
- ☐ New retinal break
- ☐ Retinal detachment
- ☐ Astigmatism of > 3 diopters
- ☐ Posterior capsule opacification
- ☐ Other, specify: _____

SECTION 2 : VISUAL ACUITY MEASUREMENT

	UNAIDED		REFRACTED (Reporting of refractive power in diopters is optional)	
	Right	Left	Right	Left
At 12 (±2) weeks post-op Date (dd/mm/yy) :				
If VA at 12 (±2)weeks post-op is not available, please provide the final available VA measurement: Date (dd/mm/yy) :				
Reasons VA not determined at 12 (±2) weeks (e.g. lost to follow-up, discharged by doctor, etc)				

SECTION 3 : POSSIBLE FACTORS IF POST-OP REFRACTED VA WORSE THAN 6/12

- ☐ High astigmatism
- ☐ Posterior capsular opacity
- ☐ Cystoid macular edema
- ☐ Endophthalmitis
- ☐ Corneal decompensation
- ☐ Decentered IOL
- ☐ Retinal detachment
- ☐ Preexisting ocular comorbidity, state what: _____
- ☐ Other, specify: _____

Name : _____

Signature: _____ Date(dd/mm/yy): ____

(Date when form is completed)