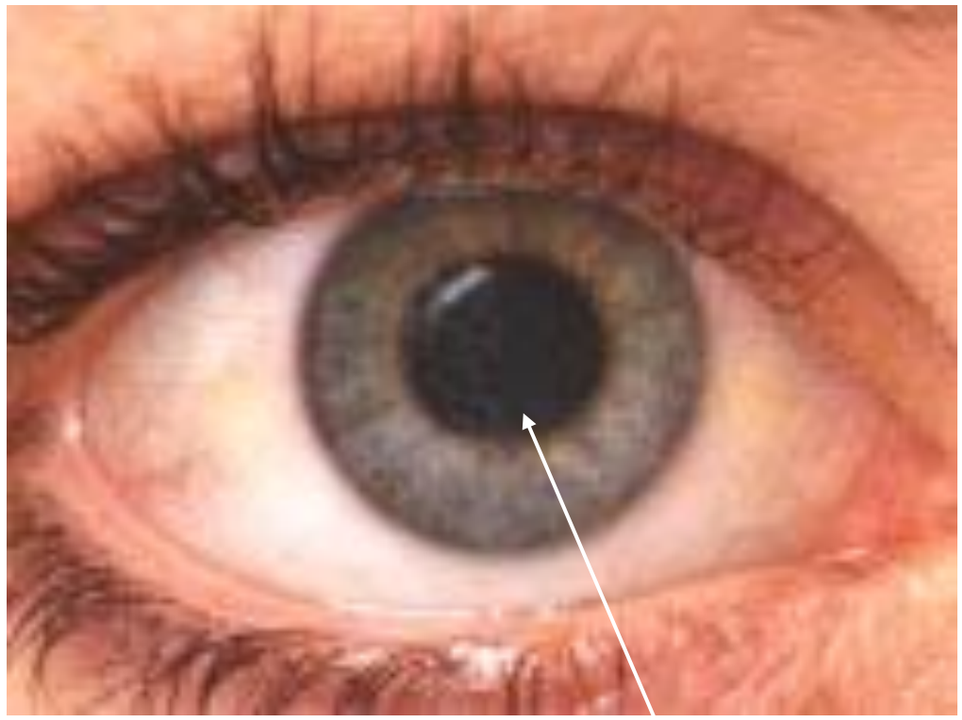
Introducing High Volume Cataract Surgery in Hong Kong

Prof David Wong

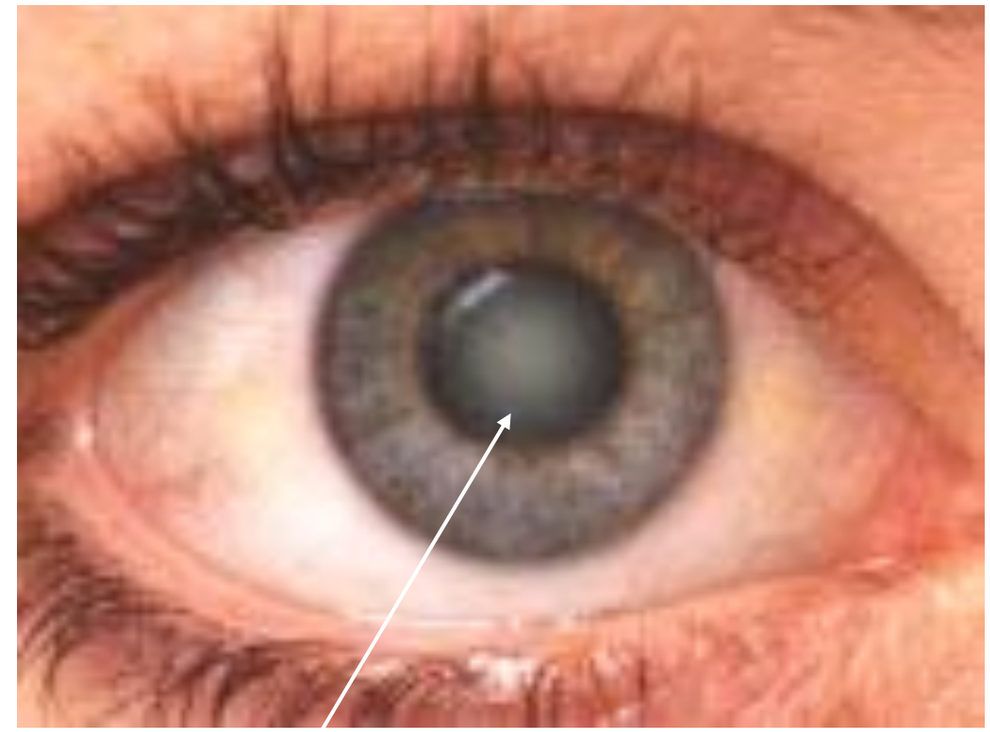
Financial Disclosure

The authors have no financial interests to disclose

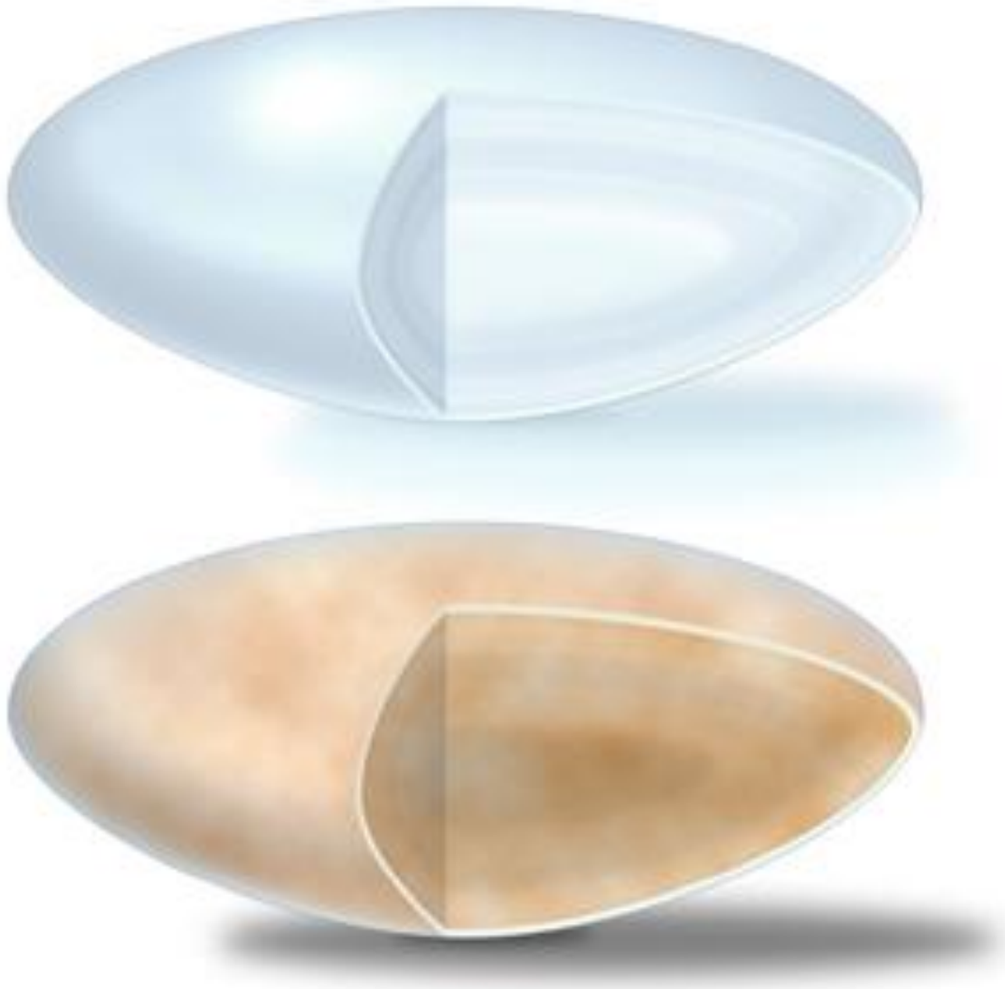
Cataracts

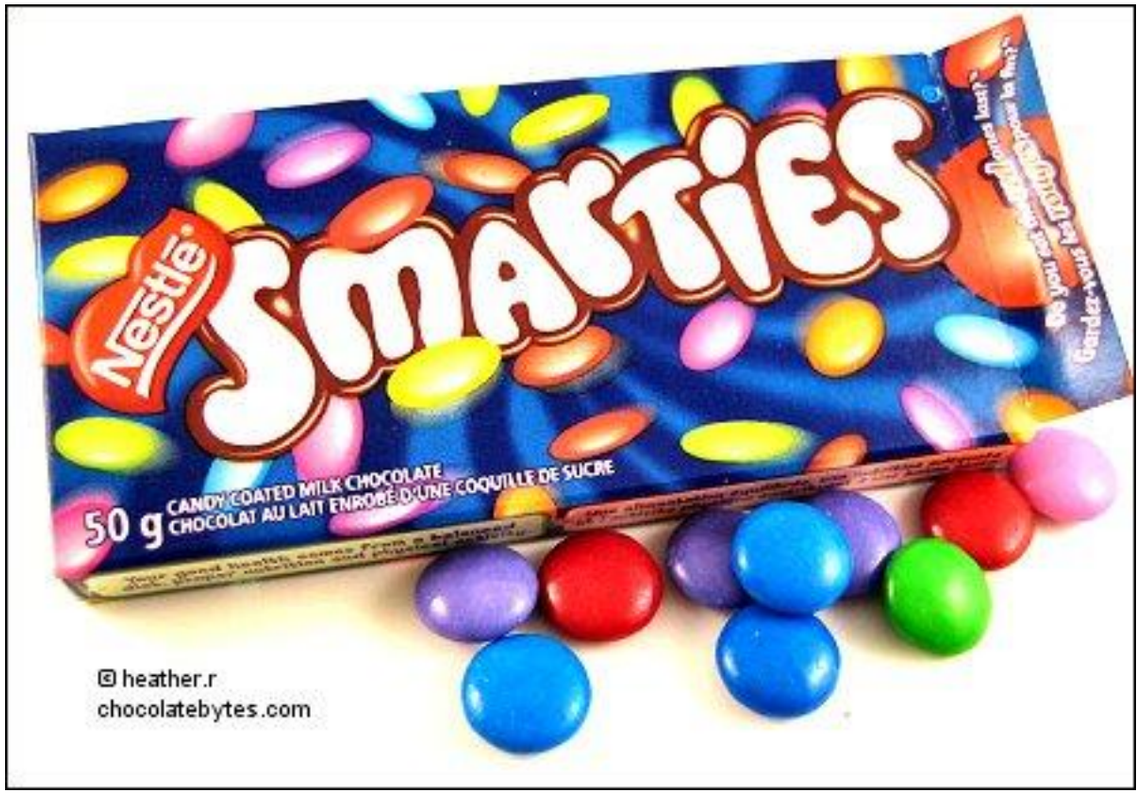


Normal Eye

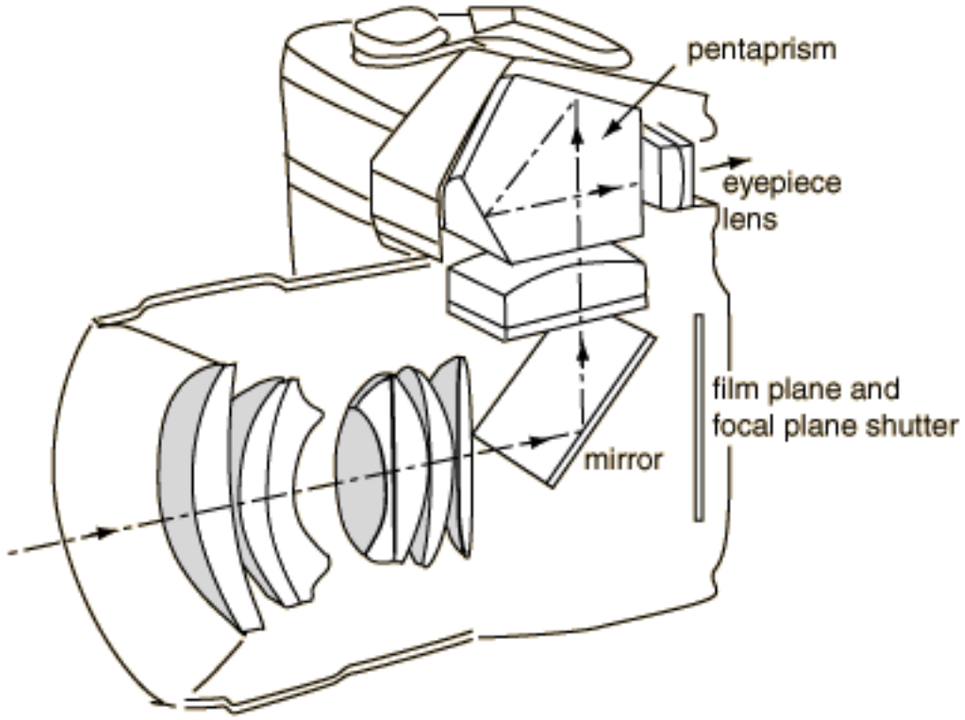


Cataract




Nestlé
SMARTIES
50 g
CANDY COATED MILK CHOCOLATE
CHOCOLAT AU LAIT ENROBÉ D'UNE COQUILLE DE SUCRE
© heather.r
chocolatebytes.com

Canon
EOS 60D
IMAGE STABILIZER
EF-S 55-250mm


pentaprism
eyepiece lens
film plane and focal plane shutter
mirror

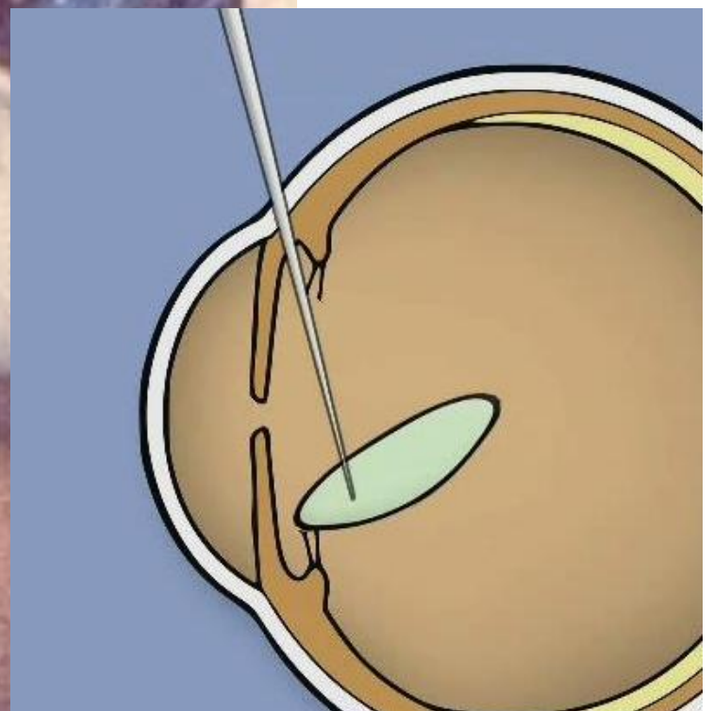
How an early stage cataract effects vision

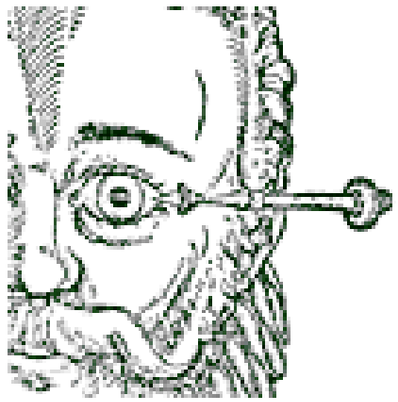
Normal vision

Vision through a cataract

Pen picture of QMH patient with cataract

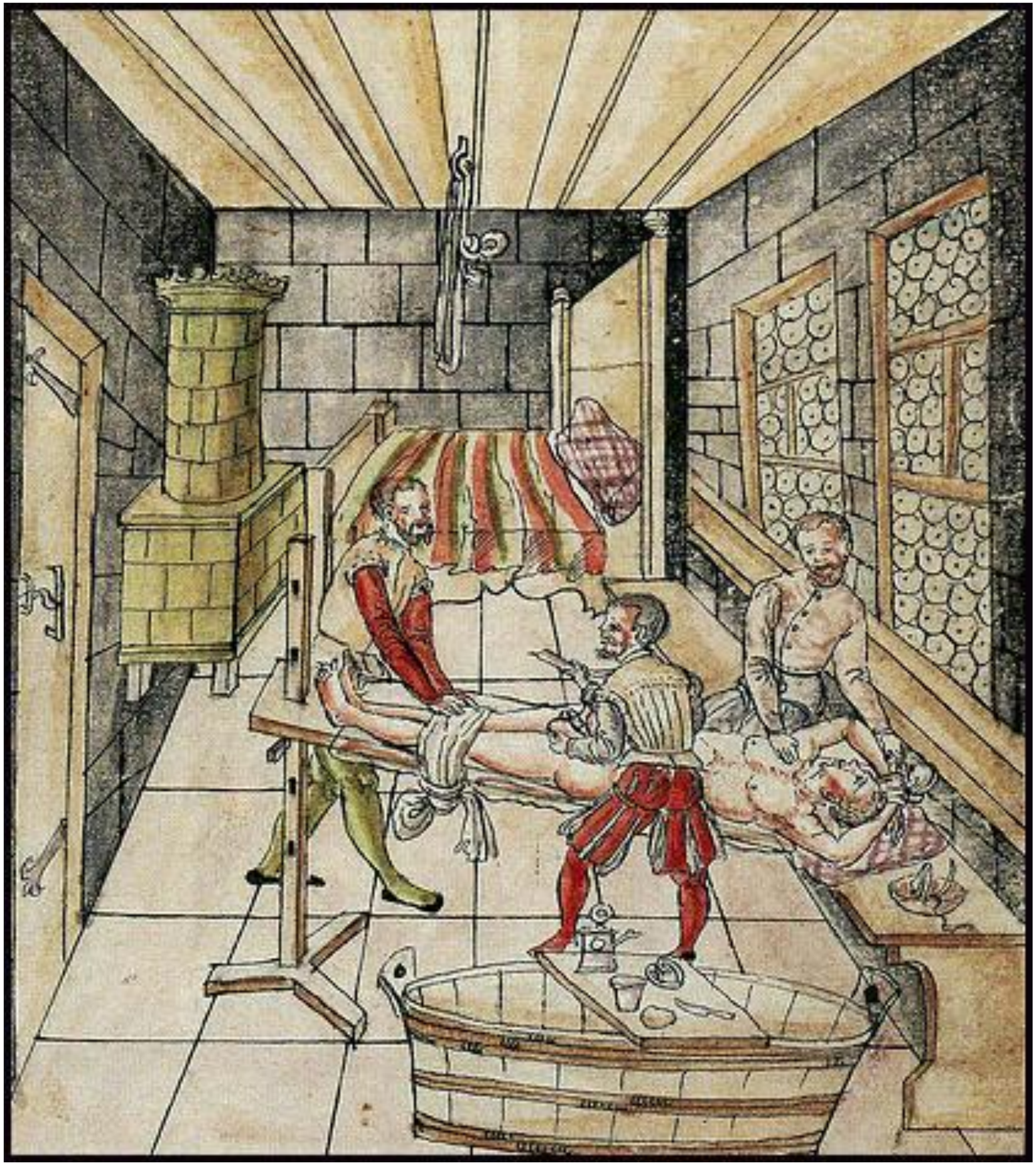
Near Activities	Reading ordinary print in newspaper	42 marks (moderate to severe difficulties) ■ Just read the headings ■ Need to use a magnifying glass ■ Eyes get tired easily
Distance Activities	Watching TV	53 marks (moderate difficulties) ■ Need to sit very close to the TV ■ Cannot see faces clearly, just rely on hearing ■ More problems/frustration if patients have hearing deficit
Social Functioning	Take a bus alone	58 marks (moderate difficulties) ■ Cannot see the route number clearly, esp when taking minibus ■ Always get on the wrong bus ■ Need to ask the driver/passengers if they get on the right bus (others might feel that annoying)
Role Difficulties	Accomplish less	48 marks (moderate difficulties) ■ Give up doing things that are not essential (eg. Sewing/playing mah-jong) ■ Ask for family/friends to check the bills they received
Dependency	Stay home most of the time	48 marks (some of the time) ■ Feel dangerous when going out ■ Avoid going out at night/under strong sunlight (? glare)





A couching procedure
from "Augendienst" by
G. Bartisch (1535-1606)

Man restrained for eye surgery
from "Augendienst"
by G. Bartisch (1535-1606)



Doctor is my cataract ripe?

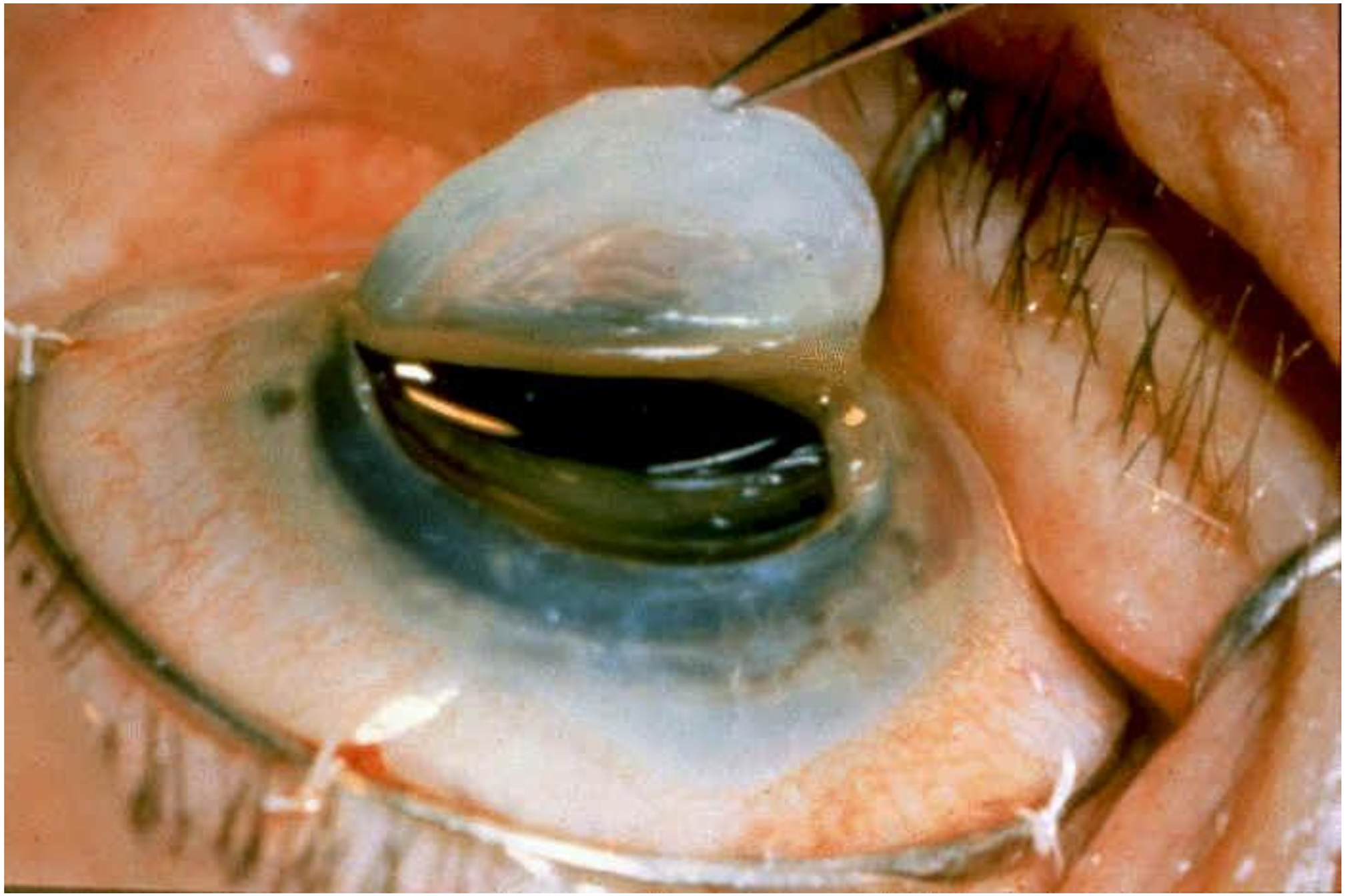
Thick glasses

Dizzy making

Restricted visual field

Both eyes

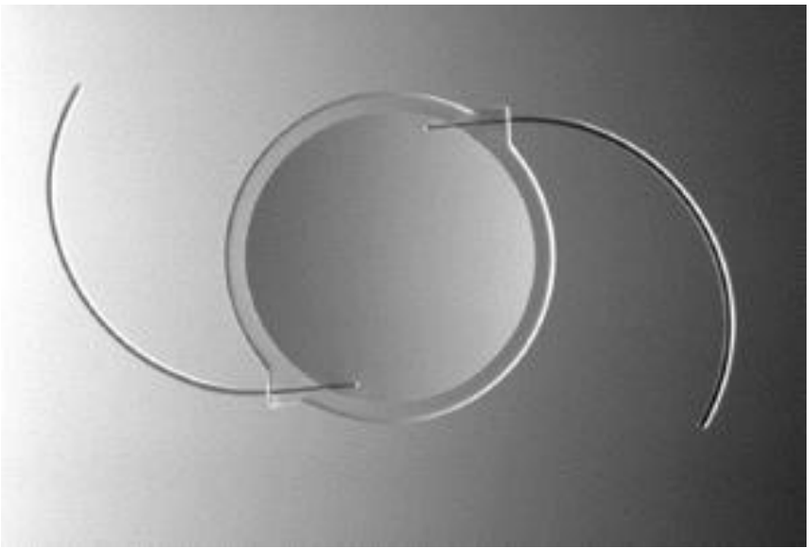
Before the 1990s

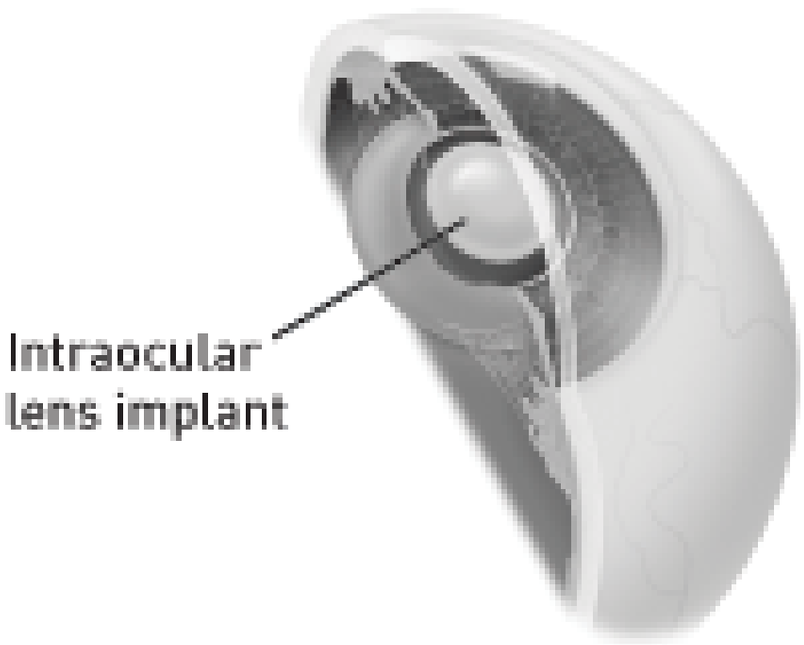


First minimally invasion small incision surgery

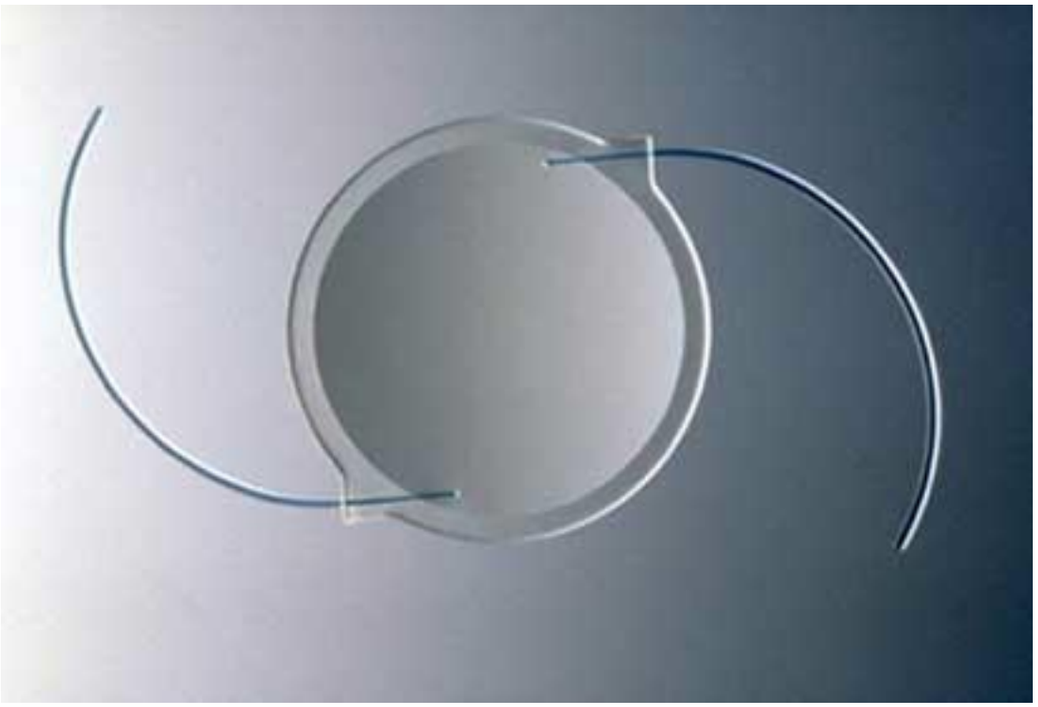
- **Phacoemulsification**: The most common method of removal. Phaco involves a small incision on the side of the cornea. A tiny probe is inserted which emits ultrasound waves that soften and break up the cloudy center of the lens so it can be removed with suction

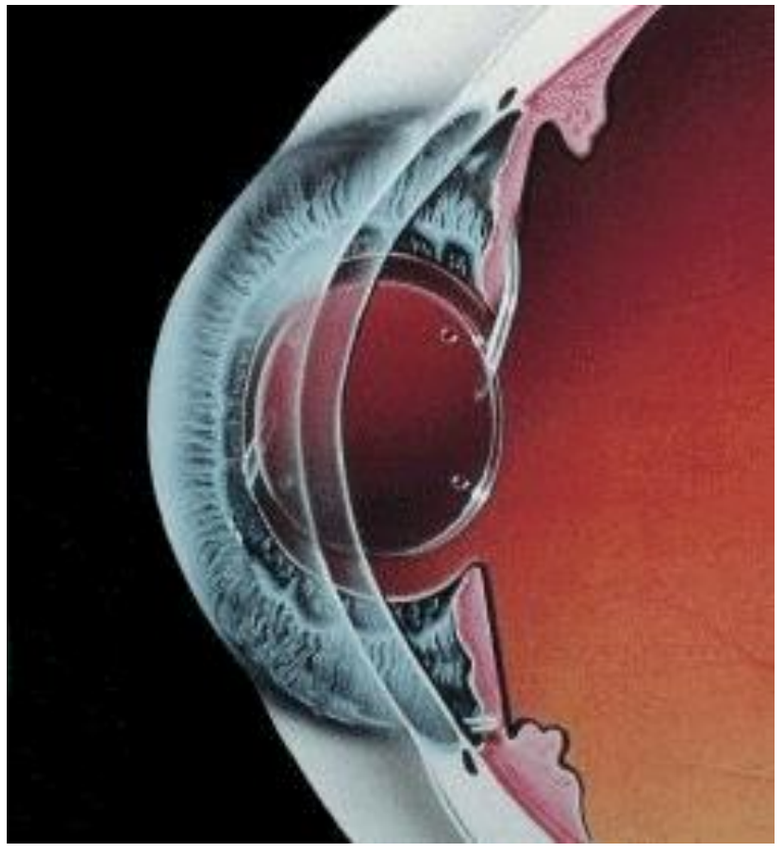
Intraocular Lens





After the lens is removed a clear, artificial lens called an Intraocular lens (IOL) is required. The IOL becomes a permanent part of the eye and must last the rest of the patients life





Sir Harold Ridley

Is cataract epidemic? Yes!

1. Intraocular lens
2. Aging population
3. Small incision surgery made it safe, thus operating before ripe

Incidence of cataract with age

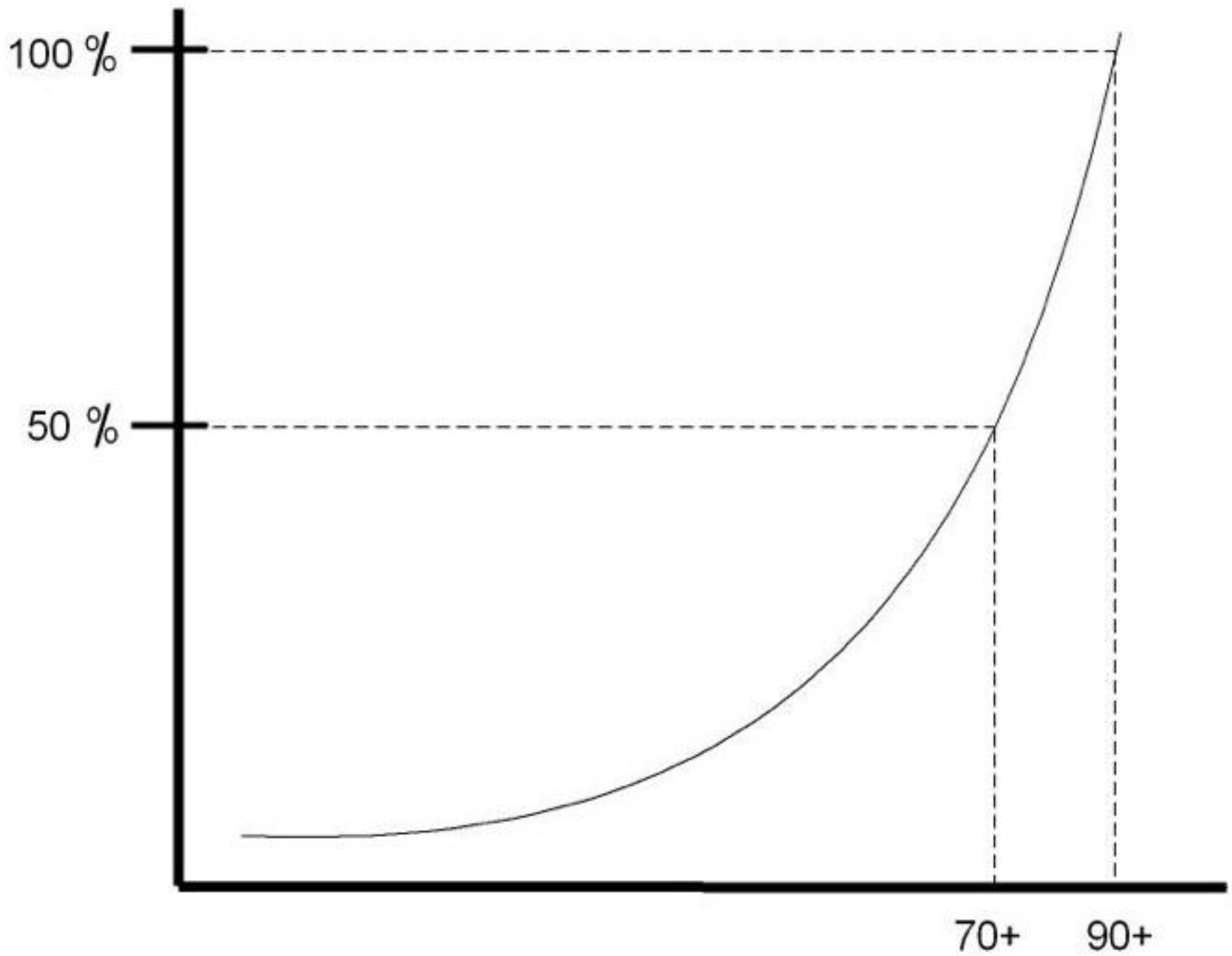
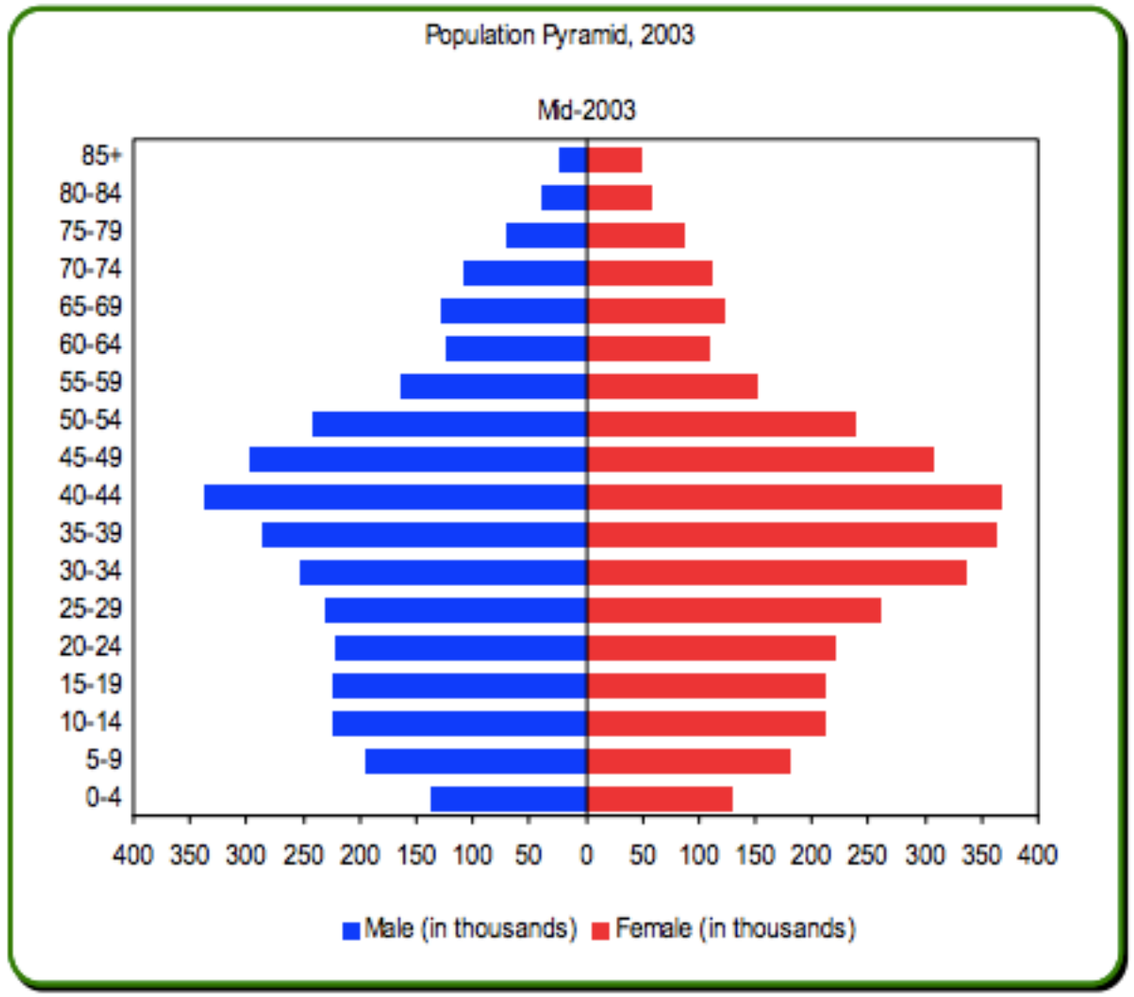
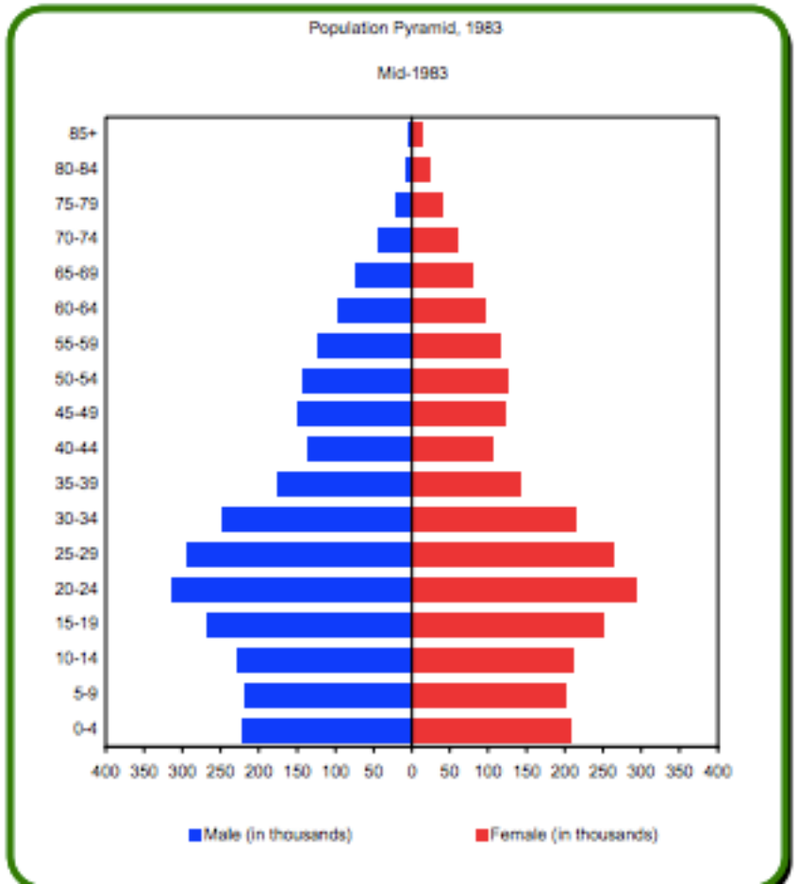
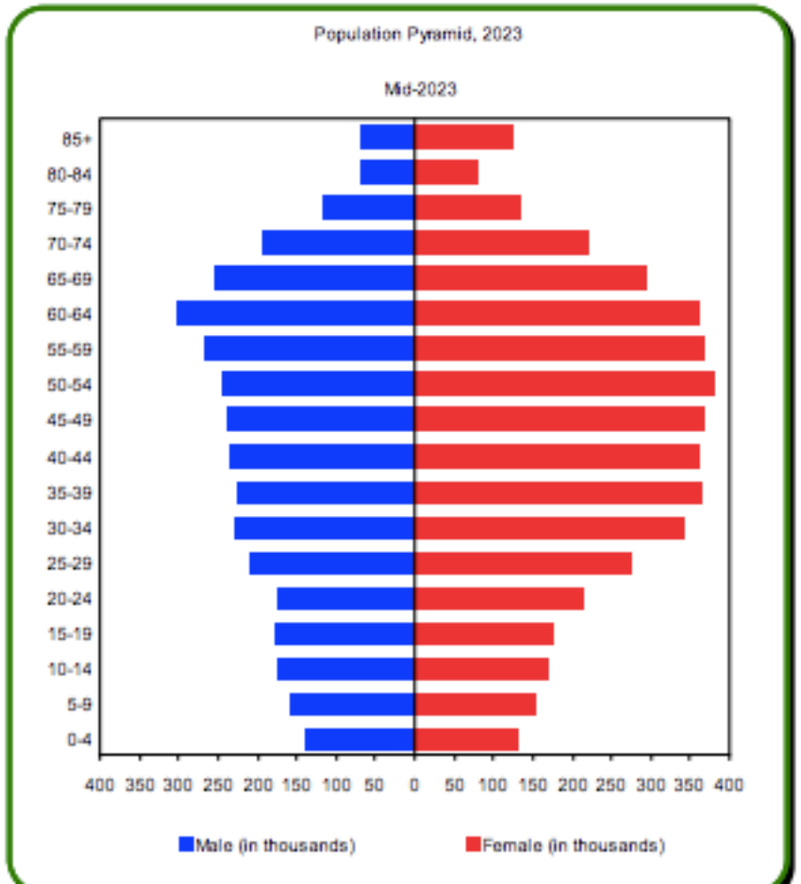


Figure 1.1: Population pyramids 1983, 2003 and 2023.







Cataract on waiting list in HA

2001 – 20622 cases

2002 – 26260 cases

2003 – 33283 cases

2004 – 37570 cases

2005 – 41946 cases

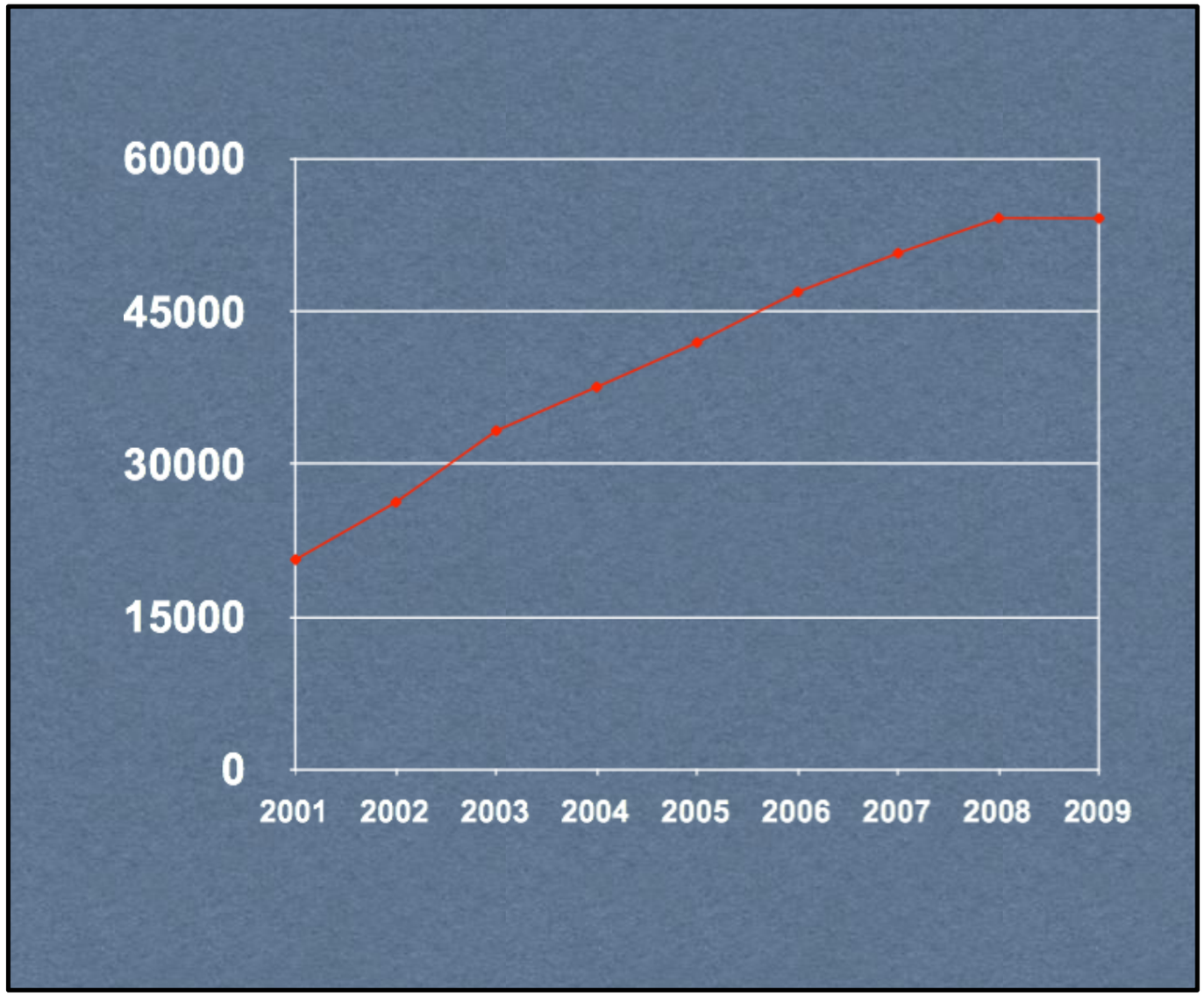
2006 – 46915 cases

2007 – 50731 cases

2008 – 54177 cases

2009 – 54153cases

2010 – pending



Population growth at a rate of 0.8% per year

Elderly population (> 65 years old) increases at a rate of 2% per year

In 2007, 10% of population is elderly .

By 2016, 22% of population will be elderly

獨家報道

眼醫「逃亡」 白內障手

東九病人等6年 輪候期憂再

公立醫院上年度醫生流失率微升至6.7%，「重災區」眼科則達11.8%，創下歷年新高，其情況已令醫管局憂慮白內障手術服務的排期要進一步延長。目前九龍東病人已要輪候6年才可做手術。

據悉，醫管局察覺眼科醫生嚴重流失，正與私營醫療研究外判白內障手術，方案之一是由全港眼科私家醫生承包該項手術。

■本報記者　譚以和

婦科12.7%最高

根據醫管局資料顯示，04至06年度，醫管局整體醫生流失率維持在6.6%；及至06/07年度，流失率表面上只微增至6.7%，但實況是部分專科嚴重流失，其中婦產科最高，流失率達12.7%，切合早前內地孕婦迫爆公私院，產科醫生紛紛出走的趨勢。

但原來眼科醫生離職亦不遑多讓，流失率達11.8%，較整體流失率顯著高。

綜合消息人士透露，明愛醫院上年度流失問題最嚴重，在11名眼科專科醫生當中，9個月內就有6人離職，一下子損失逾半數的眼科醫生。

一名明愛離職醫生告訴本報，離職者並沒有相約集體請

公院上年度醫生流失率升至6.7%，重災區眼科達11.8%，創歷年新高，離職者多為資深醫生，轉投私營市場。（資料圖片）

Why long waiting list in HK?

Supply versus demand

Public versus private

Demand driven by expectation

The threshold for cataract surgery is lower in private practice

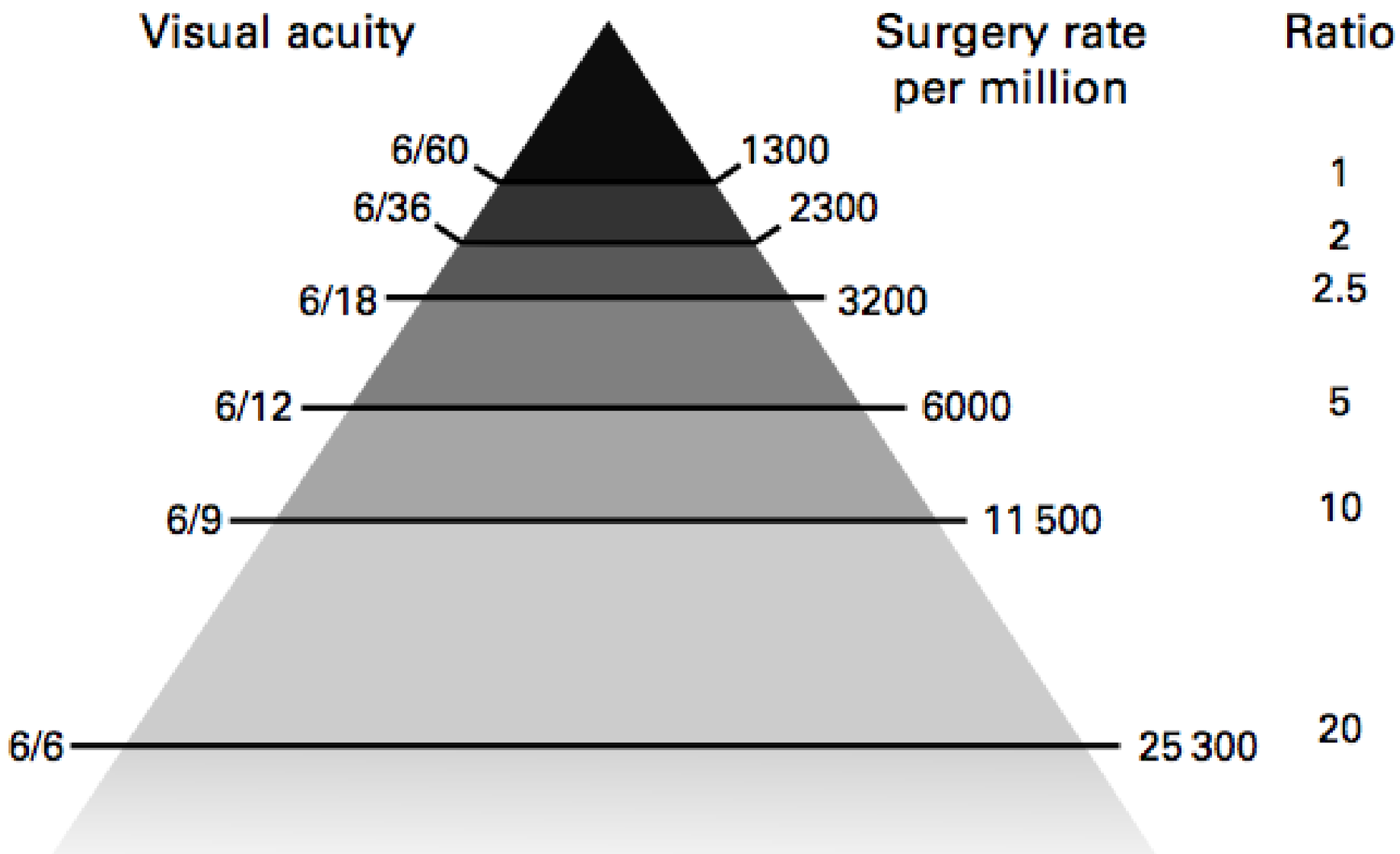


Figure 1 The golden triangle of ophthalmology; the relation between different thresholds of visual acuity and the cataract surgery rate. Data recorded from the Visual Impairment Project.[11]

Why cataract?

Highly cost effective

Cost per QALY US$600 / $6000

Utility 0.77

How to solve?

Must tackle the 3 determining factors

threshold (demand management)

demographics

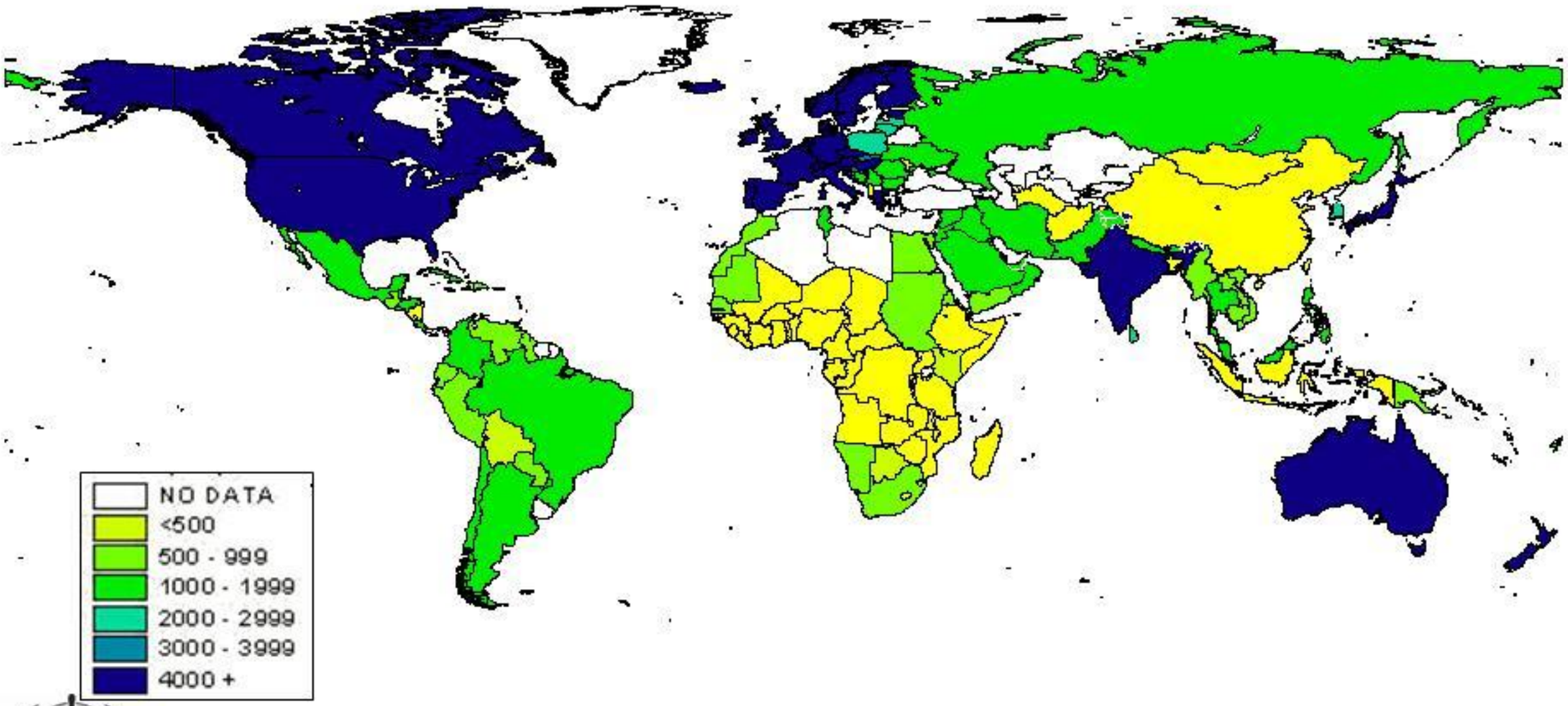
supply / backlog

Waiting list is a blunt instrument

Deter those who can afford it

But penalises those who are poor

Global Cataract Surgical Rates 2004



World Health Organization

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

International comparison of cataract surgery rate (CSR)

Australia 9,000 per million

England 6,000 per million

HK-HA 2,500 per million

Cataract Surgery Performed by Ophthalmic Teams in 4th Quarter 2007 (1 October 2007 - 31 December 2007)

Team		No. performed for 4th Quarter 2007	Increased Cases for 4th Quarter 2007 (N1)	Total No. on Waiting List as at 31 Dec 2007	Longest Waiting time as at 31 Dec 2007	Notional Waiting time as at 31 Dec 2007 (N2)
HKEC		848	923	8,344	29.0 months	29.5 months
(TWEH & PYNEH)	TWEH:	550	391	3,995	25.0 months	21.8 months
	PYNEH:	298	532	4,349	29.0 months	43.8 months
HKWC		242	324	3,178	25.0 months	39.4 months
(QMH)	QMH:	242	324	3,178	25.0 months	39.4 months
KCC		1,084	1,194	17,048	63.0 months	47.2 months
(HKEH)	HKEH:	1,084 @	1,194	17,048	63.0 months	47.2 months
KEC		190	618	8,675	33.0 months	137.0 months
(UCH & TKOH)	UCH:	190	618	8,675 #	33.0 months	137.0 months
	TKOH:	0		0		0.0 months
KWC		510	486	1,550	19.0 months	9.1 months
(CMC)	CMC:	510	486	1,550	19.0 months	9.1 months
NTEC		852	1,058	7,158	20.0 months	25.2 months
(PWH & AHNH)	PWH:	577	778	4,524	18.0 months	23.5 months
	AHNH:	275	280	2,634	20.0 months	28.7 months
NTWC		564	590	4,778	40.0 months	25.4 months
(TMH)	TMH:	564	590	4,778	40.0 months	25.4 months
Total		**4,290** (-5.9%)*	5,193 (-15.5%)*	**50,731** (+1.8%)*	**63.0 months** (0.0 months)*	**35.5 months** (+2.7 months)*

Before cataract centres

Year	No. of cases performed	No. of cases added	Total no. on waiting list
2007	4,522	6,109	49,828
2008	4,525	5,099	53,386
2009	4,533	5,104	56,707

It can be seen from the above table that before our efforts, there was no effective means to increase the capacity in 3 years. The number performed stayed more or less the same.

Two queues

One to get to outpatient appointment to establish diagnosis

one to wait for cataract

Waiting Time for SOP 1st Attendance
as at 31 December 2007

Team	Longest Waiting Time as at 31 Dec 2007		Notional Waiting Time For SOP 1st Attendance as at 31 Dec 2007	
HKEC (TWEH & PYNEH)	TWEH	(10.0 weeks)	TWEH	(10.7 weeks)
	PYNEH	(28.0 weeks)	PYNEH	(8.6 weeks)
HKWC (QMH)	QMH	(85.5 weeks)	QMH	(40.6 weeks)
KCC (HKEH)	HKEH	(31.0 weeks)	HKEH	(15.8 weeks)
KEC (UCH & TKOH)	UCH	(72.0 weeks)	UCH	(27.9 weeks)
	TKOH	(100.0 weeks)	TKOH	(55.8 weeks)
KWC (CMC)	CMC	(28.0 weeks)	CMC	(13.4 weeks)
NTEC (PWH & AHNH)	PWH	(46.0 weeks)	PWH	(28.8 weeks)
	AHNH	(63.3 weeks)	AHNH	(30.2 weeks)
NTWC (TMH)	TMH	(68.0 weeks)	TMH	(4.2 weeks)

Opportunity and solutions

Most problems are not solved by throwing money at it but by change

Action on cataract in UK

BBC NEWS

Front Page
UK
World
Business
Sci/Tech
Sport
Despatches
World News in Audio
On Air
粵語廣播
Talking Point
Feedback
Low Graphics
Help

Friday, April 24, 1998 Published at 10:58 GMT 11:58 UK

UK

Pensioner eyes up India treatment

A British pensioner frustrated by the long waiting list for a cataract operation on the National Health Service flew to India for 20 minutes of eye surgery.

Blueprint for Hong Kong

One cataract centre for HK and one for Kowloon

Increase supply

High volume list

Demand management

Donation

Shane Solomon, CE of HA

“High volume list”

3 per hour is realistic, 4 is achievable

NHS
Institute for Innovation
and Improvement

Delivering Quality and Value

Focus on: Cataracts

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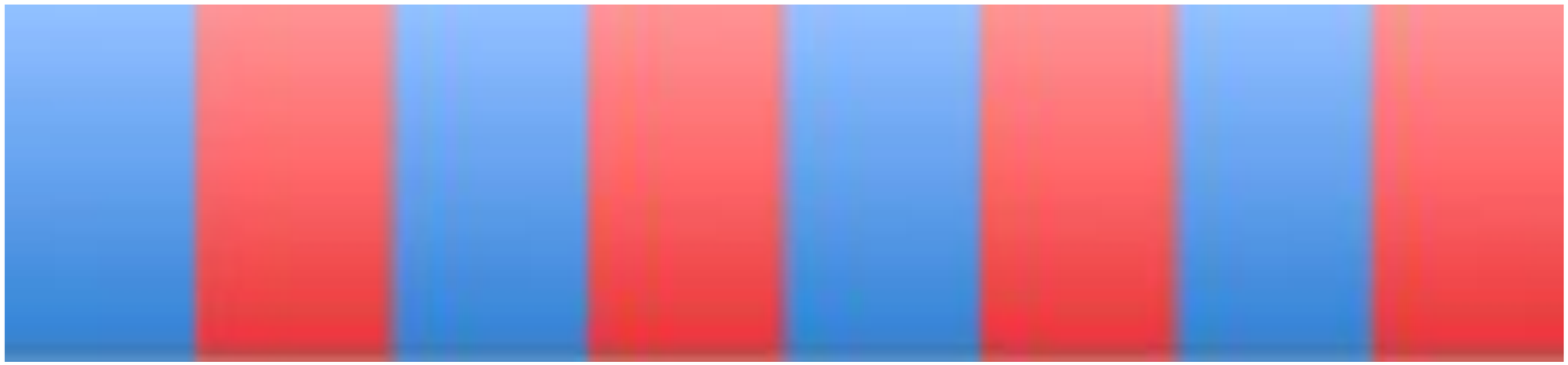

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MOORFIELDS
EYE HOSPITAL

Reference

The NHS “action on cataract”

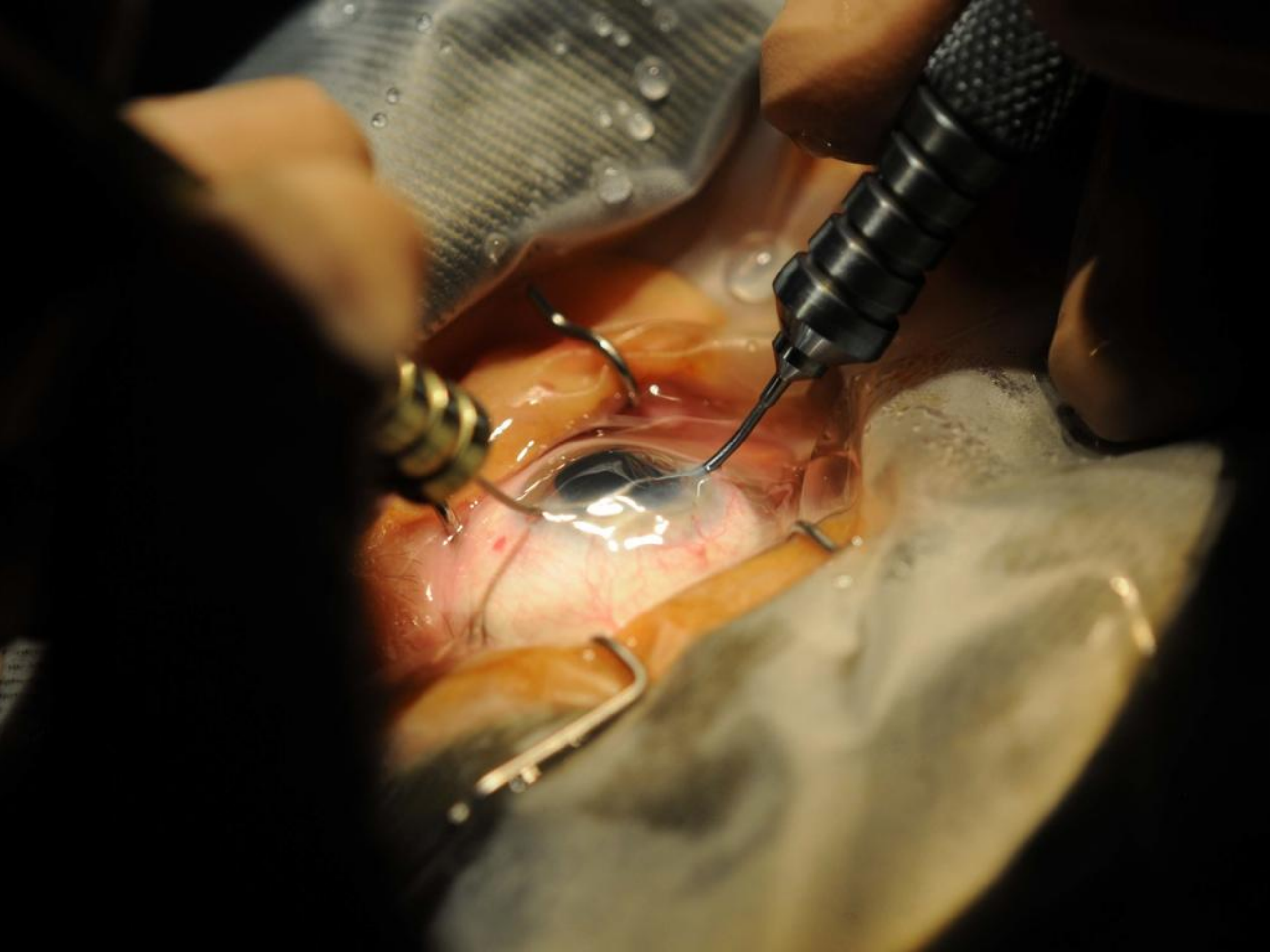
Lifeline Express, China

Private sector, Hong Kong

白內障中心
RACT CENTRE

Leica
MICROSCOPE

INFINITI
ULTRASOUND
Alcon
PROVISC
Alcon
0.85 ml
EYETEC
SINGLE
3ml Syringe



白內障
CATARACT

Features

User friendly: e.g. own clothes

Minimal turnover time

Procedure room standard

Topical anaesthesia / 100% day case

Average Non-surgical Time in the High Volume List at GH Cataract Centre

Month	Average Turnover Time per Month
	High Volume List
November	2 mins 33 s
December	3 mins 11 s
January	2 mins 47 s
February	2 mins 44 s
March	2 mins 42 s
April	2 mins 36 s
May	2 mins 31 s
June	2 mins 28 s
Overall Turnover Time	**2 mins 41 s**

Cataract Numbers in HKWC

2007 / 8	650
2008 / 9	1,000
2009/10	1,400
2010 / 11	4,500
2011 / 12	4,500

GH cataract centre opens Nov 2009

+3,100 cases

Notional waiting time (months) in different clusters 2006-2010

	HKE	HKW	KCC	KEC	KWC	NTE	NTW	HA
2006	26.7	35	43.2	73.5	13.5	21.4	35.6	32.7
2007	29.5	39.4	47.2	137	9.1	25.2	25.4	35.5
2008	31	55.6	48.5	86.3	11.2	25.3	21.1	35.4
2009	30	50	25.8	45.8	17	50	20	31.8
2010	39	5	27	38	21	24	18	25

Questions arising?

Is fast safe?

Is it a quality service?

Is it cost effective?

Are we doing too many?

Importance of Audit

Based on UK National cataract data set

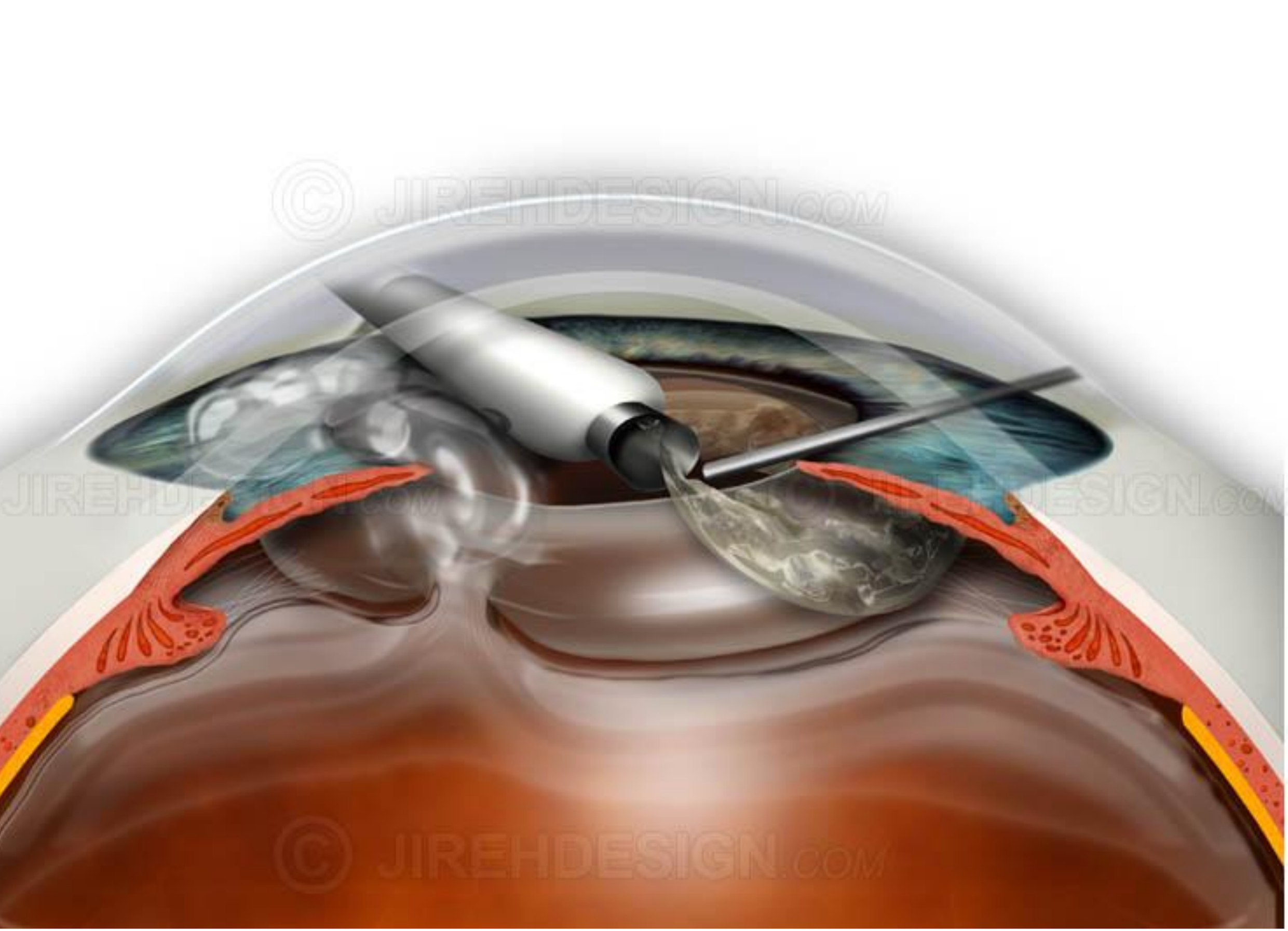
Every case

15,000 consecutive series in HKWC

5,000 in KEC

Two important indices to measure safety and quality

1. Posterior capsule rupture and vitreous loss
2. Endophthalmitis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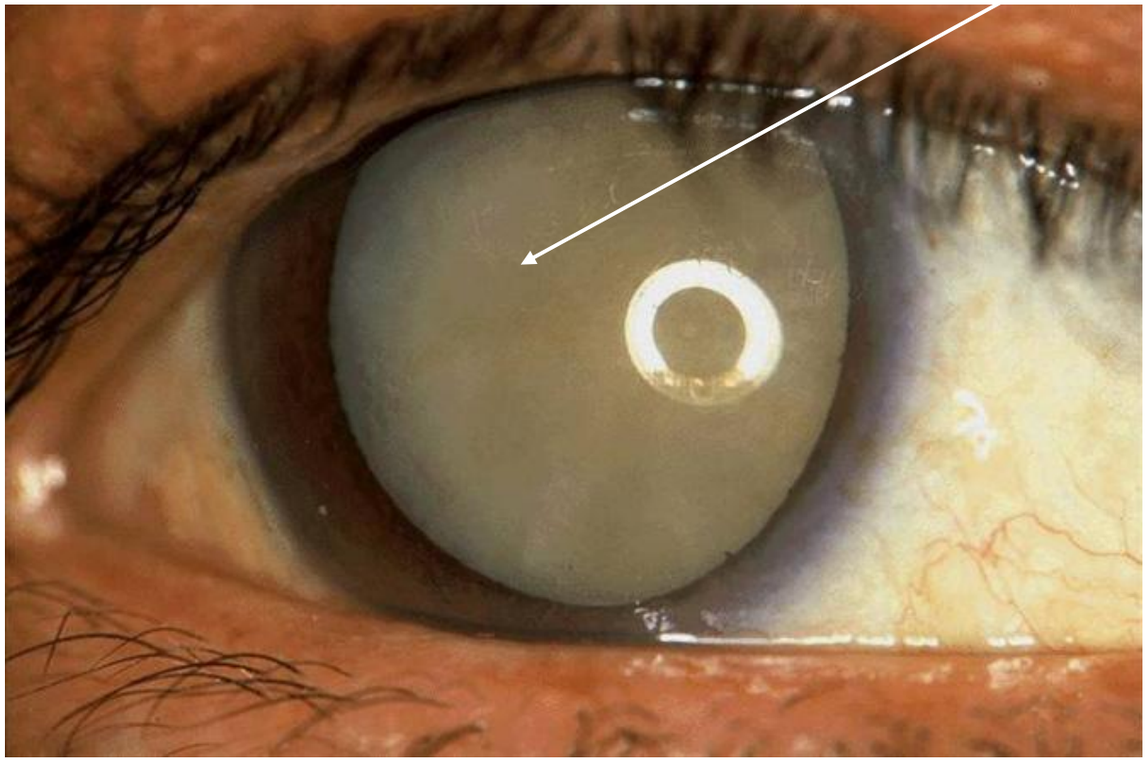
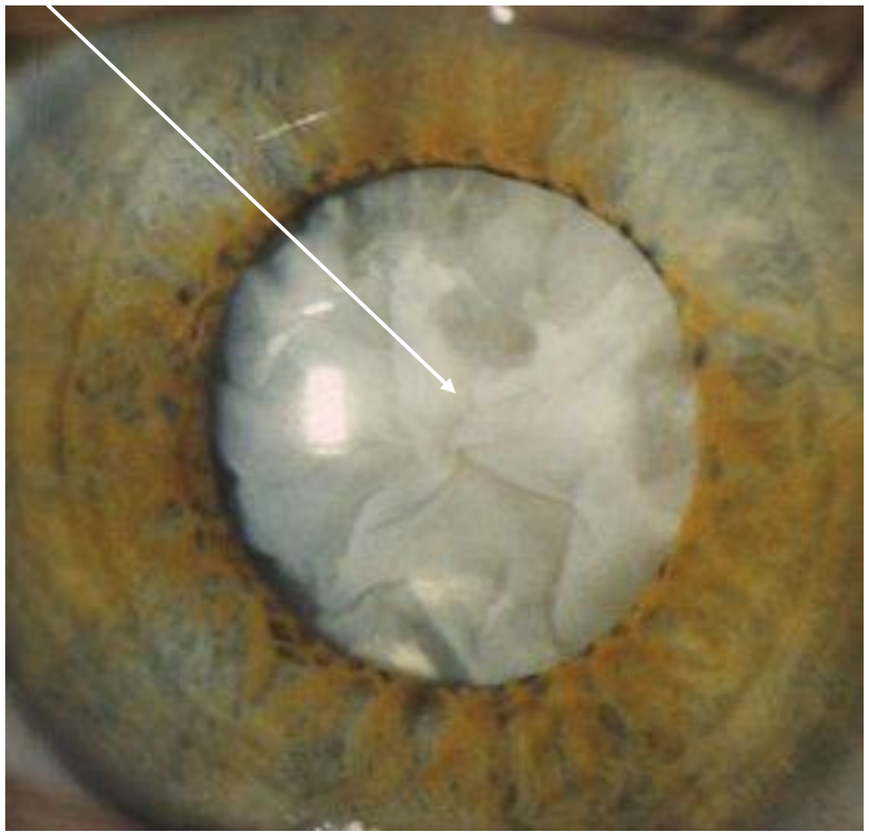
What does a late-stage cataract look like?





Endophthalmitis: Infection

Devastating

Cannot hide

One is 700 nationally and internationally

Incidence of Acute endophthalmitis

Acute endophthalmitis in 2002

Total: 0.173% (4/2300)

TWEH:0.16% (3/1800)

QMH: 0.2% (1/500)

Endophthalmitis rate is zero

15,000

1 in 700 internationally

expected 20+ cases

found zero

Operating fast thus safety and quality is compromised

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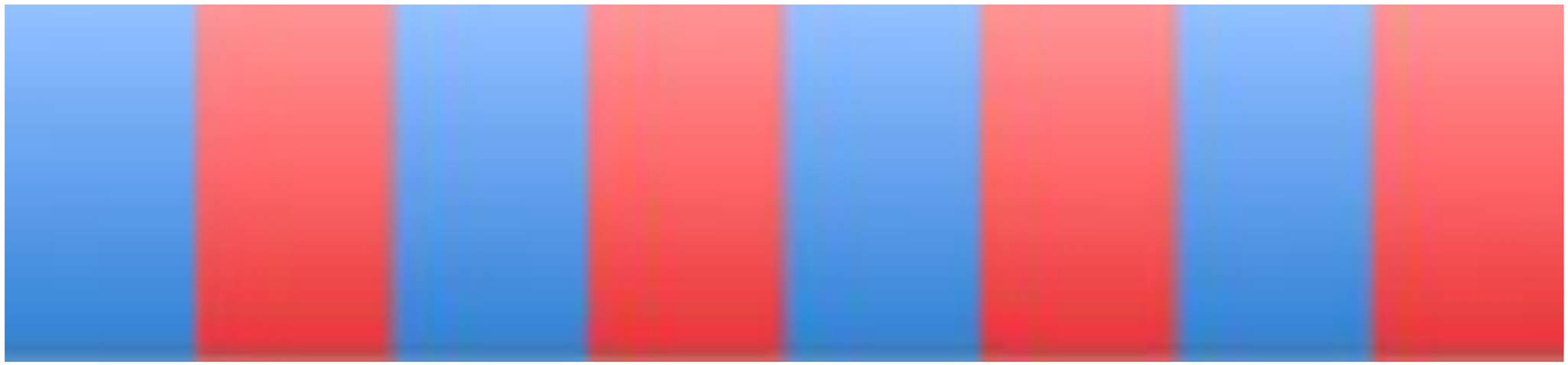

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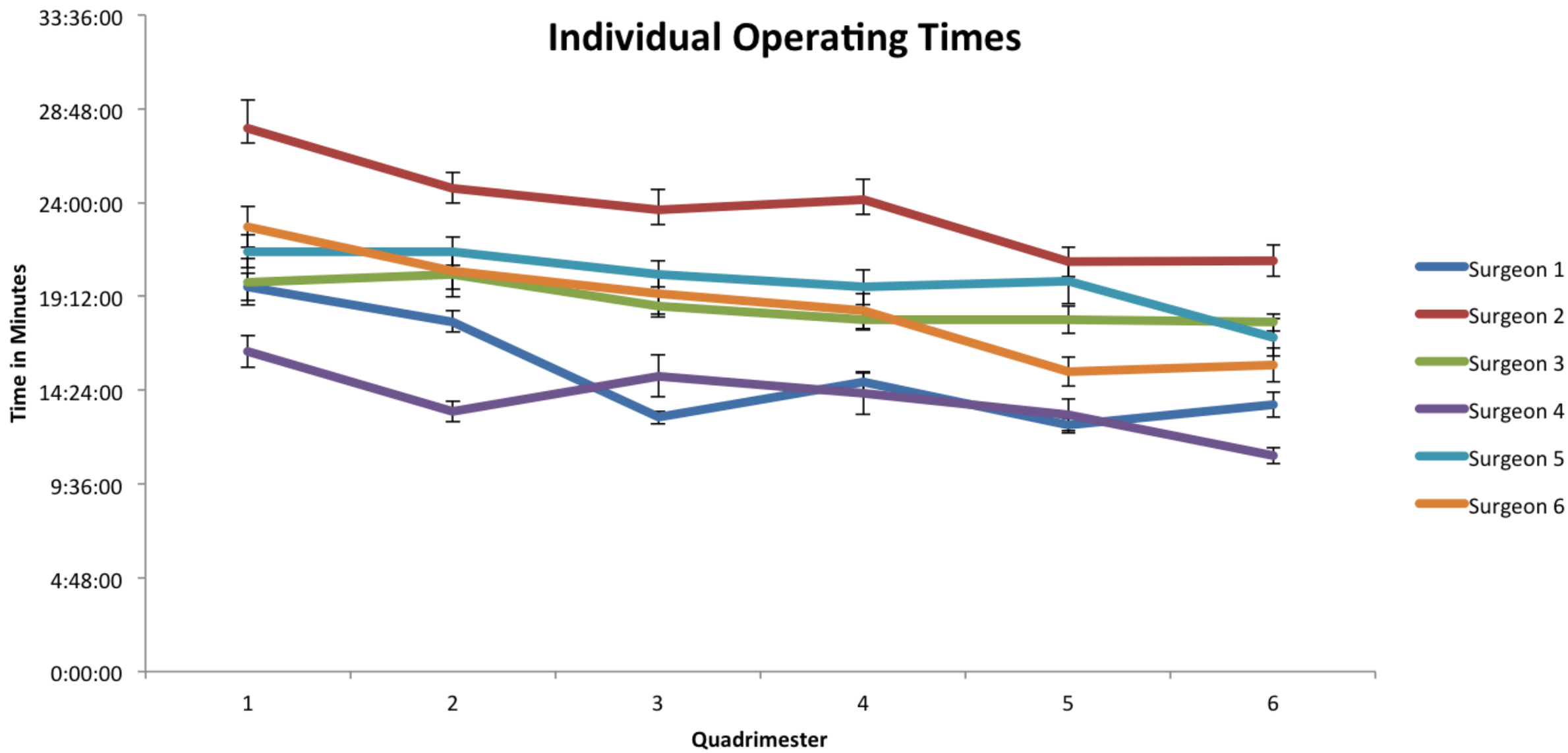
Impact of Surgeon Participation in High Volume Cataract Surgery on Individual Operating Times

KC Shih[1,2], KS Chan[2], DS Wong[1,2]

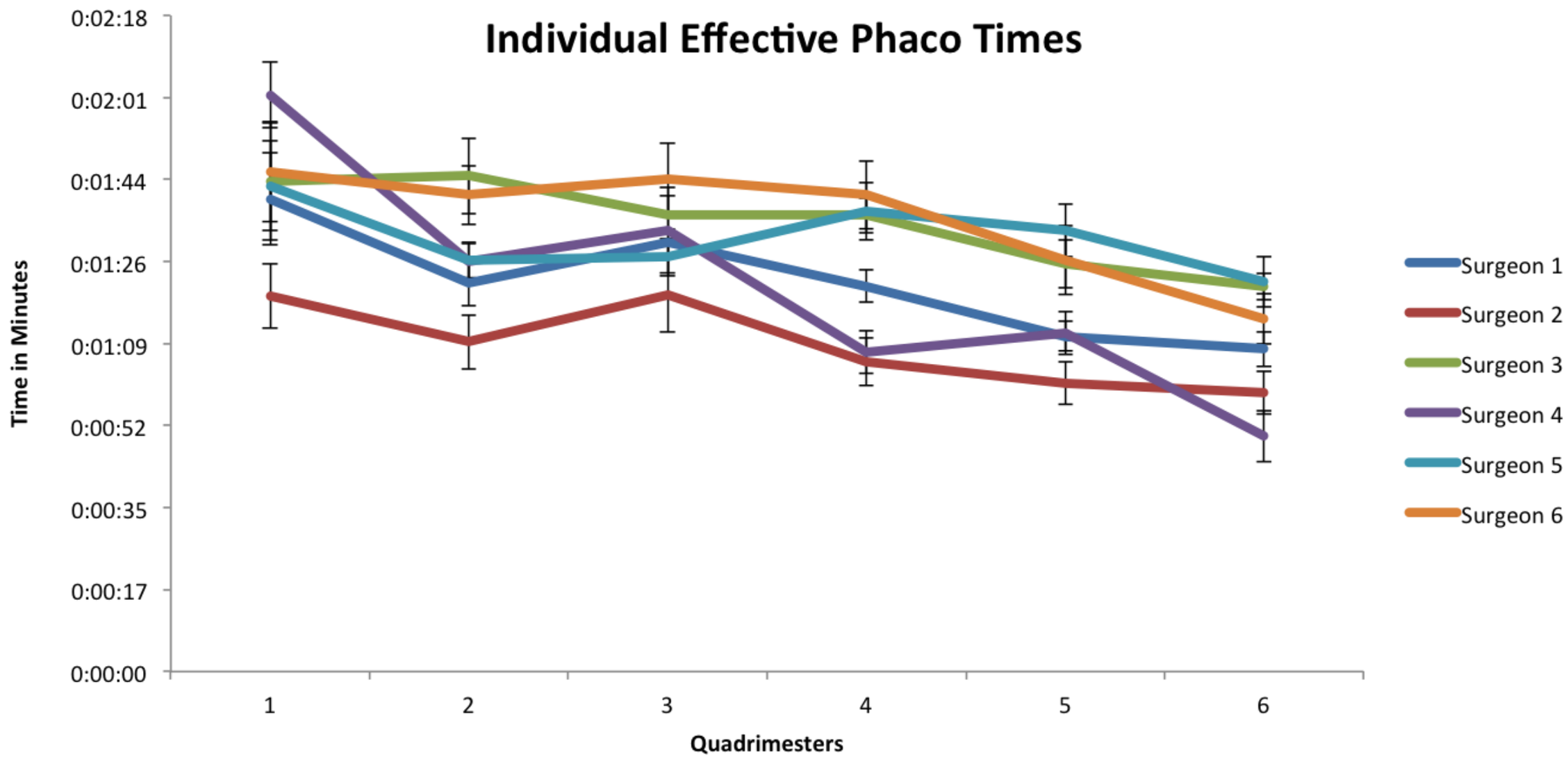
[1]Department of Ophthalmology, University of Hong Kong
[2]Department of Ophthalmology, Queen Mary Hospital

Results

Surgeon	Operation Count
No. 1	1181
No. 2	631
No. 3	905
No. 4	625
No. 5	868
No. 6	784
Total	4994



•The step-wise reduction was present after separation for individual surgeons



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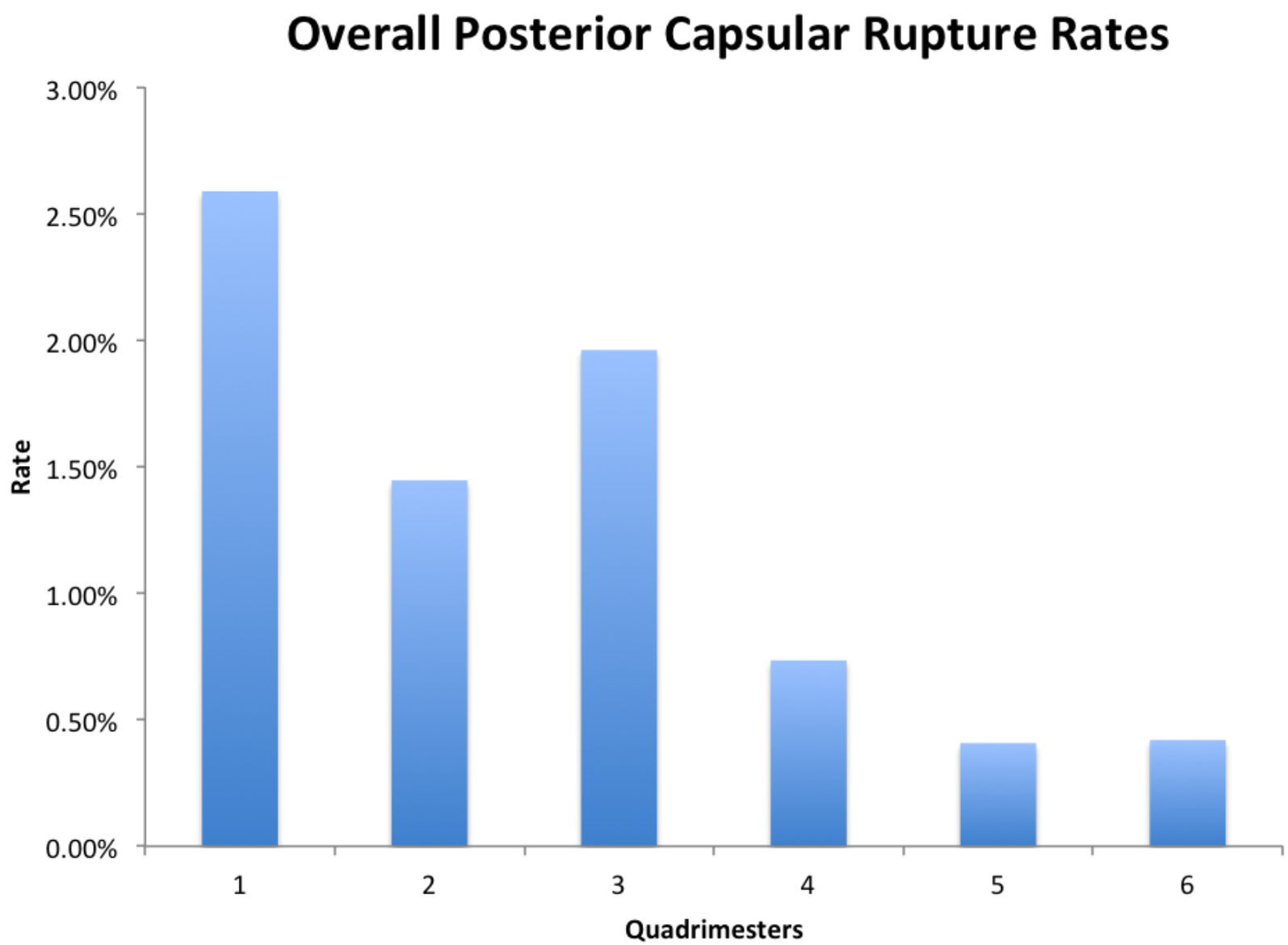

•Intraoperative posterior capsular rupture and/or vitreous loss rates declined over time

Conclusion

The more you do, the faster you get

As you get faster, fewer complications occur

Limit is not tested

What about for group as a whole?

	Mean Procedure Time	Median Procedure Time	Complicatio n Rate	Total Number of Operation	Turnover Rate	Procedure Time
Mean Procedure Time			-0.143 (p=0.525)	-0.527 (p=0.012)		
Median Procedure Time			-0.151 (p=0.501)	-0.469 (p=0.028)		
Complication Rate						
Total Number of Operation			-0.038 (p=0.867)			
Turnover Rate						
Procedure Time					0.254 (p<0.001)	

As a group

The more, the faster still holds true but the limit has not been tested

Operating time is not correlated with complication.....

The standard deviation range vary

For faster surgeons, their standard deviation remains high

Treating different patients differently

Audit data: for training

Above 250 cases, the incidence of PC rupture dramatically reduces

Number can be used as index of competency

It can also be used as index of complication rate

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Questions arising?

Is fast safe?

Is it quality? Comparatively

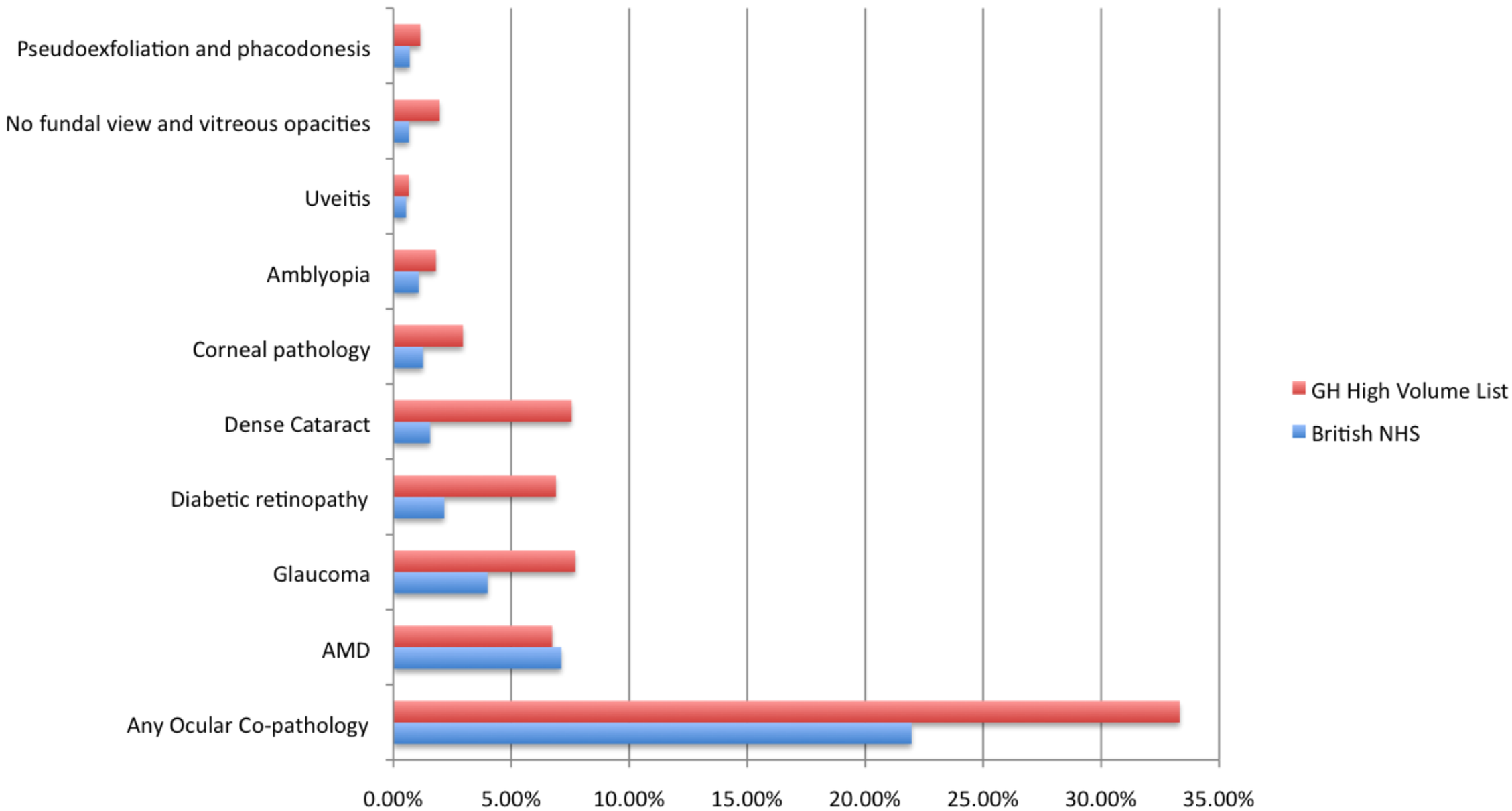
Is it cost effective?

Are we doing too many?

Comparison of Patient Demographics Between High Volume List and British NHS

		British NHS	GH High Volume List
Age	Mean	75.4	75.8
	SD	10.4	8.57
Gender	Male	21090 (38.00%)	233 (38.26%)
	Female	34406 (62.00%)	376 (61.74%)
Pre-operative VA	0.5 or better	238000 (88.24%)	39 (6.40%)
	<0.5 -0.1	26288 (9.75%)	437 (71.76%)
	<0.1 to NPL	5440 (2.02%)	133 (21.84%)

Comparison of Preoperative Risk Factors Between High Volume List and British NHS



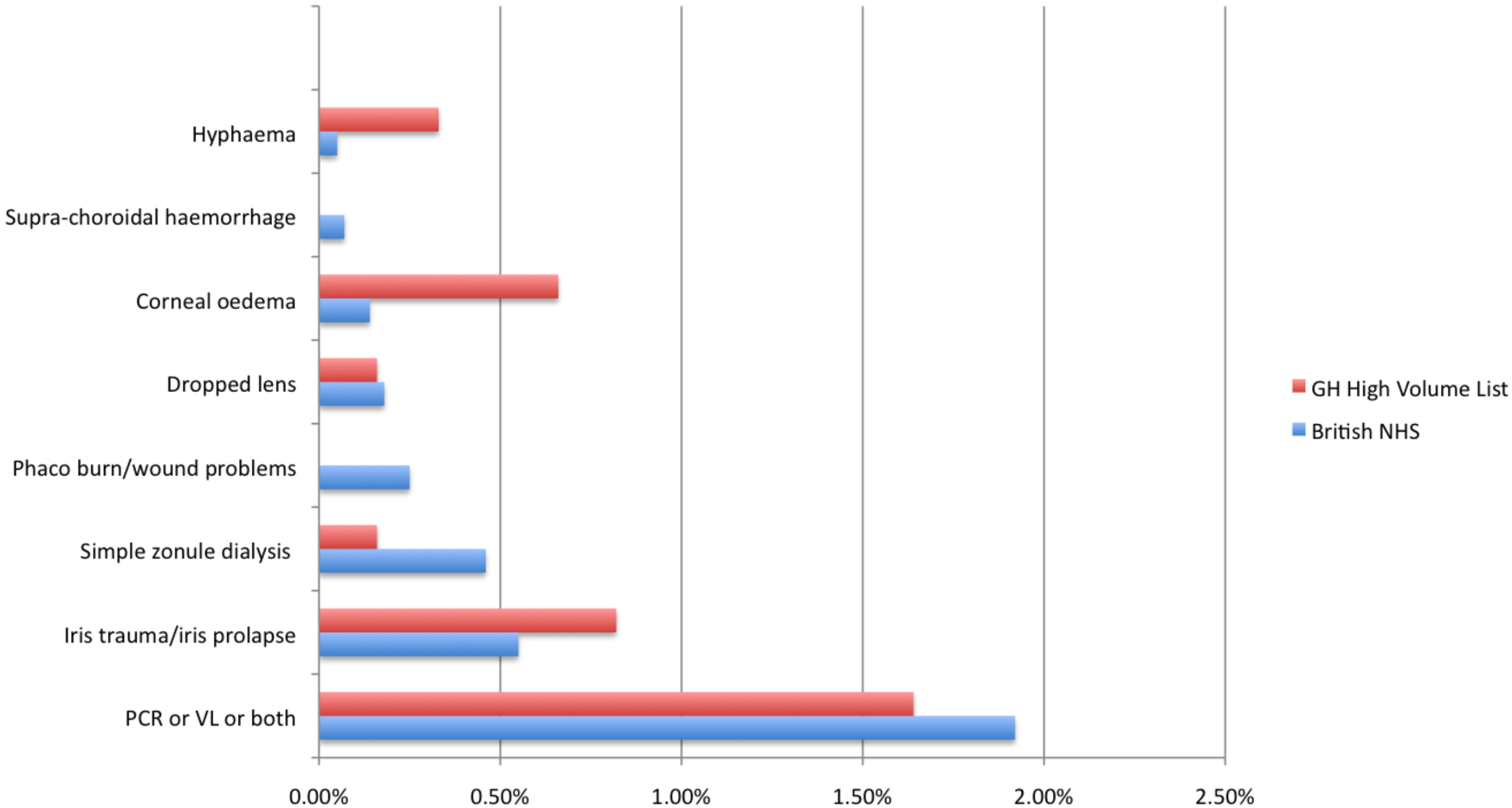
GH Cataract Centre Complications

	High Volume	Service	Training	Total
Phacoburn	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Corneal edema	4 (0.66%)	0 (0.00%)	1 (0.60%)	5 (0.54%)
Iris damage	5 (0.82%)	1 (0.65%)	5 (2.98%)	11 (1.18%)
Hyphema	2 (0.33%)	0 (0.00%)	2 (1.19%)	4 (0.43%)
Zonule Dialysis	1 (0.16%)	4 (2.58%)	0 (0.00%)	5 (0.54%)
PCR	8 (1.31%)	3 (1.94%)	9 (5.36%)	20 (2.15%)
VL	4 (0.66%)	4 (2.58%)	6 (3.57%)	14 (1.50%)
PCR and/or VL	10 (1.64%)	6 (3.87%)	10 (5.95%)	26 (2.82%)
Dropped lens	1 (0.16%)	0 (0.00%)	1 (0.60%)	2 (0.21%)
Subchoroidal hemorrhage	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)

Comparison of Complication rates Between High Volume List and British NHS

Complications	British NHS	GH High Volume List
PCR or VL or both	1068 (1.92%)	10 (1.64%)
Iris trauma/iris prolapse	305 (0.55%)	5 (0.82%)
Simple zonule dialysis	256 (0.46%)	1 (0.16%)
Phaco burn/wound problems	140 (0.25%)	0 (0.00%)
Dropped lens	99 (0.18%)	1 (0.16%)
Corneal oedema	76 (0.14%)	4 (0.66%)
Supra-choroidal haemorrhage	38 (0.07%)	0 (0.00%)
Hyphaema	29 (0.05%)	2 (0.33%)

Comparison of Patient Demographics Between High Volume List and British NHS



Preliminary Post-operative Patient Survey at GH Cataract Centre for High Volume List

	Very Satisfied	Satisfied	No comment	Dissatistifed	Very Dissatisfied
Environment	20 (38.00%)	31 (60.00%)	1 (1.92%)	0 (0.00%)	0 (0.00%)
Staff Working Attitide	45 (87.00%)	7 (13.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Overall service	32 (62.00%)	20 (38.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)

Preferred Choice of Operation Centre	
Queen Mary Hospital	0 (0.00%)
GH Cataract Centre	52 (100%)

Questions arising?

Is fast safe?

Is it quality?

Is it cost effective? (Are there any alternatives)

Are we doing too many?

On price alone

	Budget Amount	Cost per case to QMH	To other clusters
2009-2010	400 for 4.5 million	11,257	
2010-2011	3,100 for 23.3 million	7,523	10,301

Is waiting list initiative an alternative?

About waiting list initiatives

Waiting list initiatives are temporary solutions - unless supply and demand are matched, then the problem comes back.

It will also be increasingly difficult to shorten waiting list

Therefore

What about public private initiative?

Review and Project on Patient Invitation

List date	Invitated Px No.	Issue date	Time waited when being-invited to CSP	Actual/Projected wating time when received surgery in CSP	No. of Patient Joined	% of Joined Patient	No. of Surgery done	% of Surgery done
Batch 1 <2003								
2003								
2004-01 to 2004-06	4000	Feb-03	>3y8m	4y8m	855	21%	685	80%
Batch 2 2004-07 to 2005-08	4000	Apr-04	2y8m-3y10m	3y5m	1232	31%	952	77%
Batch 3 2005-09 to 2006-06	4700	Sep-05	2y3m-3y	2y11m	1417	30%	913	64%
Batch 4 2006-07 to 2007-01	4600	Dec-06	2y-2y6m	2y7m	1346	29%	253	19%
Batch 5 2007-02 to 2007-07	4500	Mar-09	1y9m-2y1m	2y3m	1350	30%		
Batch 6 2007-08 to 2008-01	6000	Jun-09	1y6m-1y10m	2y	1800	30%		
2008-02 to 2009-02								
Grand Total	27800				8000		6400	80%

Private public initiatives

Can work well

But must be affordable

Otherwise you would penalise those who cannot pay

Same criticism levelled at using waiting list as a means to curb demand

Middle class feels squeezed

Caught in the middle

Elderly

No recurrent income

Questions arising?

Is fast safe?

Is it quality?

Is it cost effective? (Are there any alternatives)

Are we doing too many?

Are we doing too many?

Motivation part economical:

Pay more do more e.g. Australia

Pay less do faster e.g. USA

In UK, cataracts cross subsidise other services, doing more or less affects viability of units

Demand management

Is real

Threshold for surgery must be agreed by consensus

Lowering threshold would create much larger demand than expected

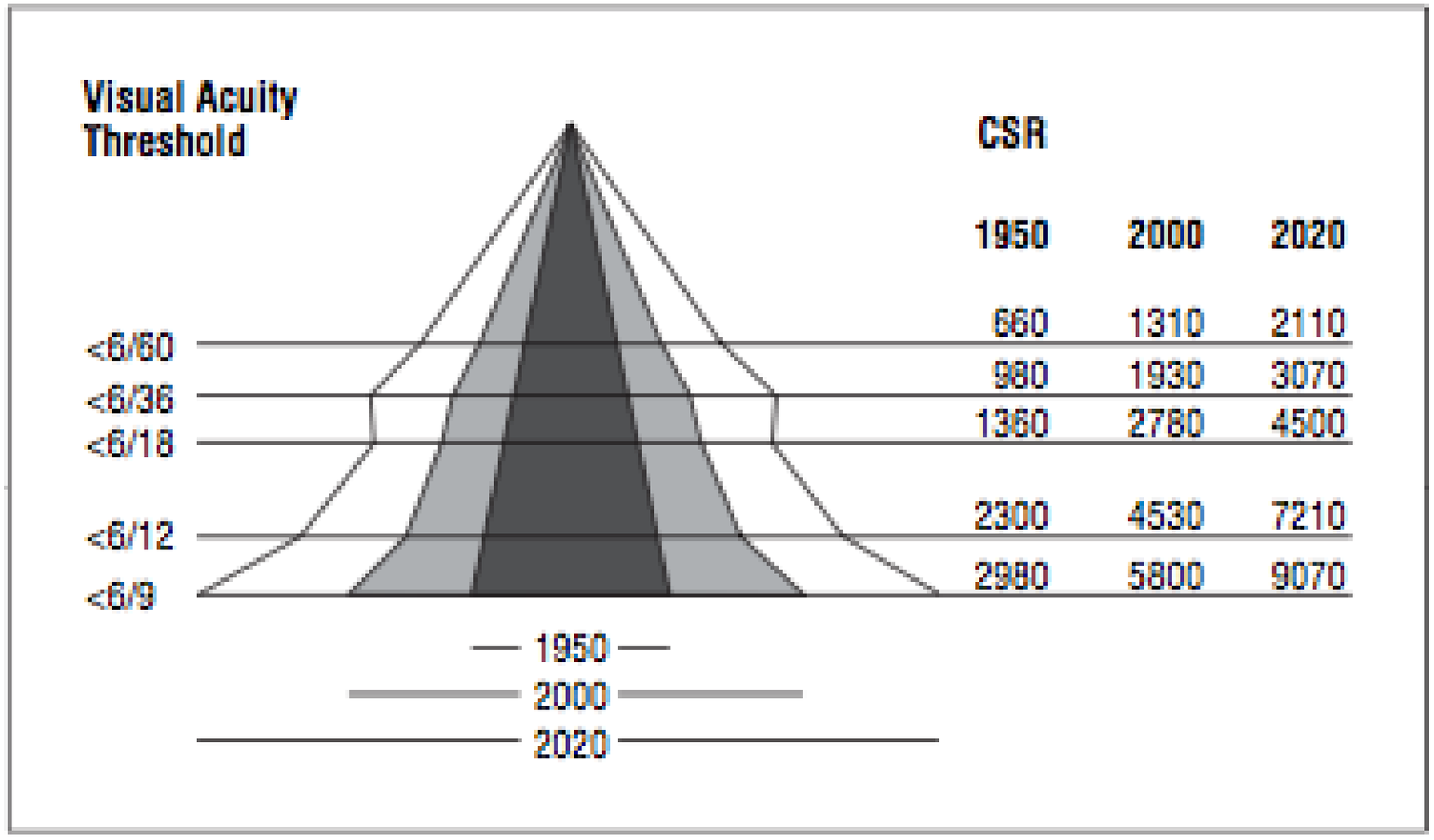


Figure 2. The relation between the prevalent cataract surgery rate (CSR) (incident and backlog) and visual acuity thresholds for the Australian population in 1950, 2000, and 2020.

Conclusion: how was it done?

As in UK by real investment into recurrent expenses

Setting up an accountable, transparent and efficient system

P4P

Opening remarks by SFH at the Special Meeting of LegCo Finance Committee

Opening remarks by SFH at the Special Meeting of LegCo Finance Committee
****

In 2011-12, the Government's recurrent expenditure on health stands at $39.9 billion, which amounts to 16.5% of the Government's total recurrent expenditure and represents an increase of more than $3.1 billion over the revised estimate of 2010-11. Since 2007-08, the Government's recurrent expenditure on health has been increased cumulatively by a total of about $9.4 billion or more than 30%.

3) increase the number of cataract surgeries, expected to benefit 6,000 patients;

Was it the right thing to do?

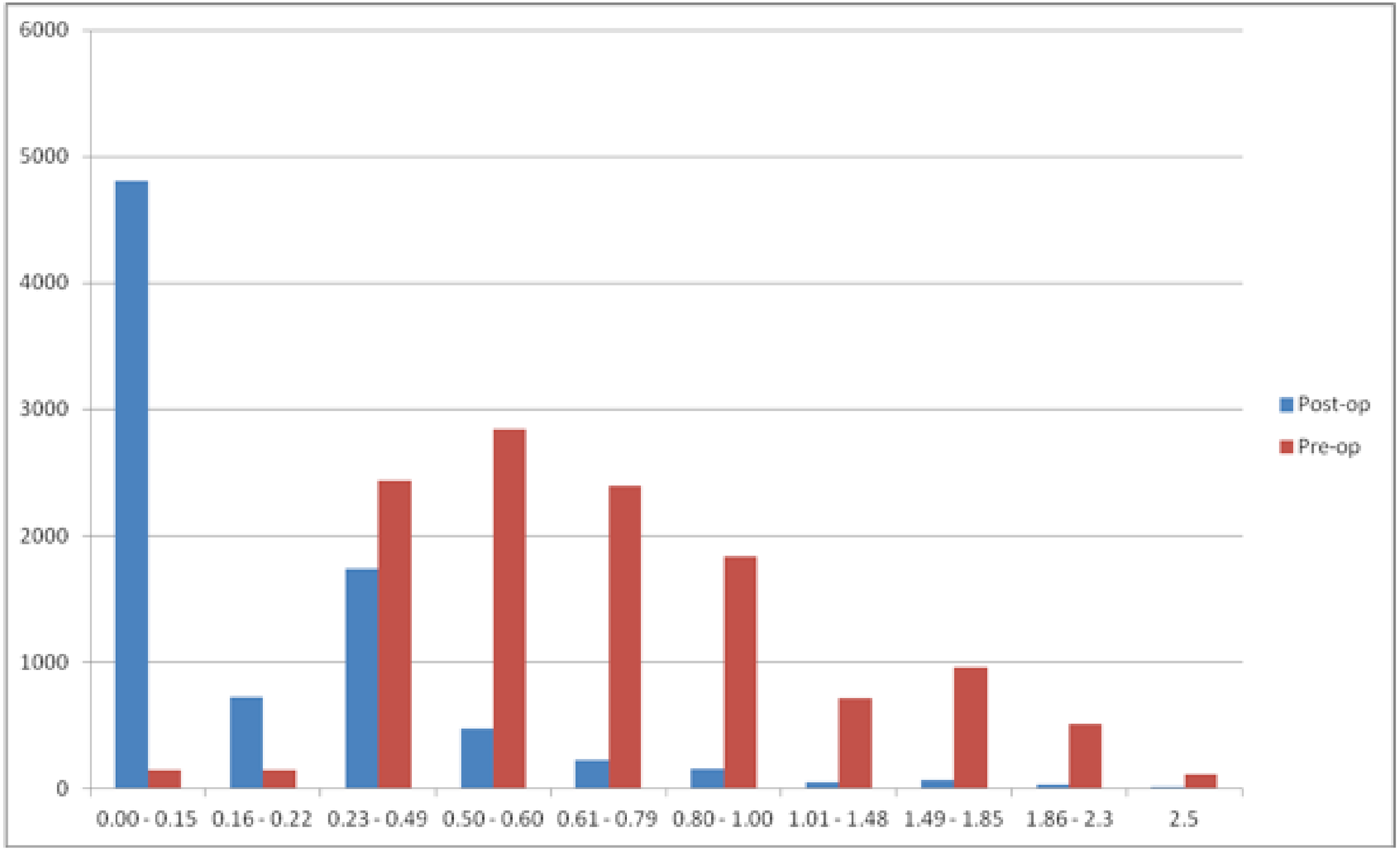
It is a matter of perspective

From the patients: yes

From the tax payer: good accountability

From the HA surgeon: skill is enhanced

Was it all worth it?



Cataract versus others

Objective evidence of cost effectiveness

Can bear scrutiny

Compare like with like still good value