

Updating from Eye Bank Association of India (EBAI)

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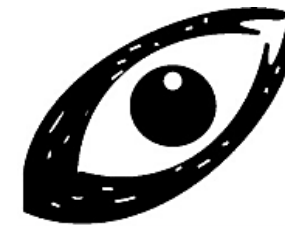
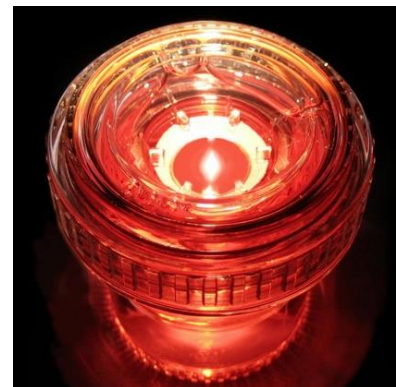
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Financial interest - None



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Let Your Eyes Change Someone's Life

Eye Banking in India # History

- 1940 – **First Eye Bank in India** started in Regional Institute of Ophthalmology in Madras (now Chennai)

- 75 Years

- 1965 – Established **National Eye Bank**, AIIMS, New Delhi

- 50 years

- 1990 – **Eye Bank Association of India (EBAI)**

- 25 Years

This Year
we are ...



of
EBAI



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Corneal blindness: a global perspective

John P. Whitcher,¹ M. Srinivasan,² & Madan P. Upadhyay³



Diseases affecting the cornea are a major cause of blindness worldwide, second only to cataract in overall importance. The epidemiology of corneal blindness is complicated and encompasses a wide variety of infectious and inflammatory eye diseases that cause corneal scarring, which ultimately leads to functional blindness. In addition, the prevalence of corneal disease varies from country to country and even from one population to another. While cataract is responsible for nearly 20 million of the 45 million blind people in the world, the next major cause is trachoma which blinds 4.9 million individuals, mainly as a result of corneal scarring and vascularization. Ocular trauma and corneal ulceration are significant causes of corneal blindness that are often underreported but may be responsible for 1.5–2.0 million new cases of monocular blindness every year. Causes of childhood blindness (about 1.5 million worldwide with 5 million visually disabled) include xerophthalmia (350 000 cases annually), ophthalmia neonatorum, and less frequently seen ocular diseases such as herpes simplex virus infections and vernal keratoconjunctivitis.

Even though the control of onchocerciasis and leprosy are public health success stories, these diseases are still significant causes of blindness — affecting a quarter of a million individuals each. Traditional eye medicines have also been implicated as a major risk factor in the current epidemic of corneal ulceration in developing countries. Because of the difficulty of treating corneal blindness once it has occurred, public health prevention programmes are the most cost-effective means of decreasing the global burden of corneal blindness.

Keywords: Corneal diseases/epidemiology; Blindness/etiology; Eye injuries/epidemiology; Ocular/prevention and control; Trachoma/drug therapy; Onchocerciasis; Leprosy/prevention and control (source: MeSH)

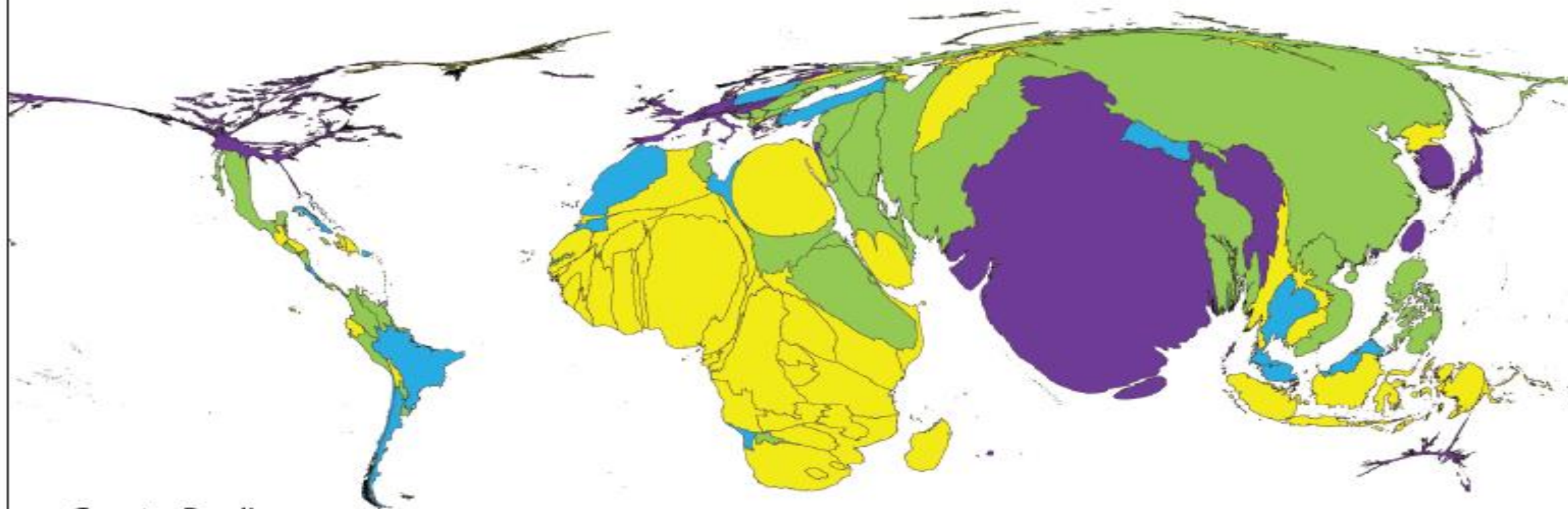
Corneal Blindness: **India**

- 6.8 million people (vision <6/60)
 - ✓ 1 million = **Bilateral**
 - ✓ **Curable by Keratoplasty = Approx. 10 %**
- This figure will be 10.6 million in 2020
 - “RAAB study - 2007” = Corneal blindness= 1% of total blindness.
 - New patients/year = **40,000 – 50,000 (??)**

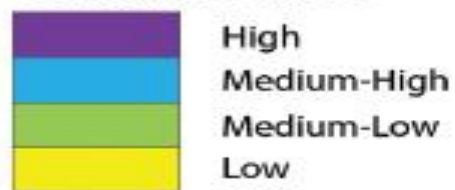
1. **Dandona et al.** *Br J Ophthalmol.* 2003; 87:133-41
2. **NPCB-2012;** *News Letter,* NPCB; Govt of India.

Corneal Blind Estimates and Corneal Transplantation Readiness

*Size of countries reflects the population of corneal blind.
Colors represent readiness for eye banking and corneal transplantation.*



Country Readiness



Why we need ROBUST Eye Banking in INDIA ?

Oliva MS et al. *Indian J Ophthalmol*.2012;60:423-7

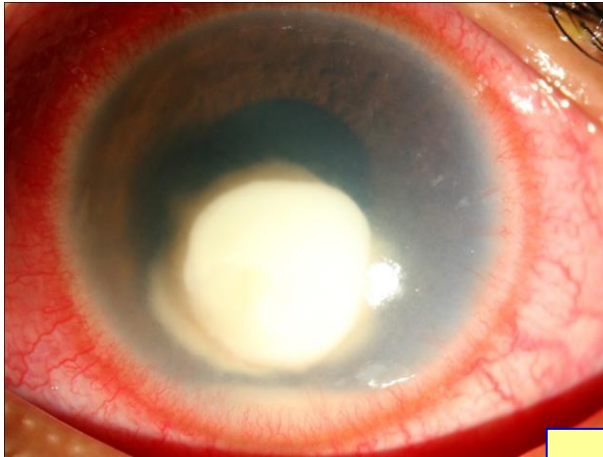
Corneal Blindness:

Major causes in INDIA

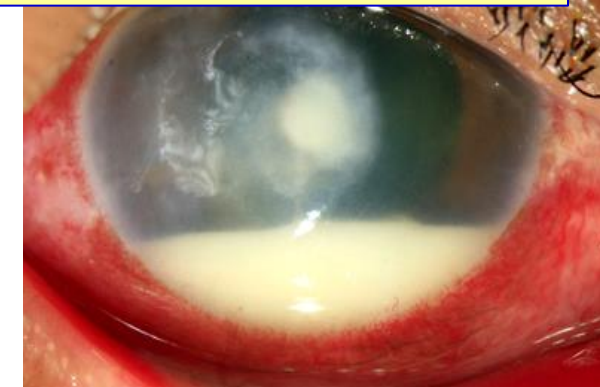
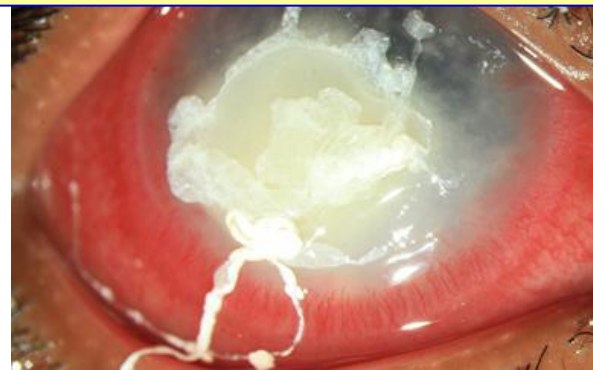
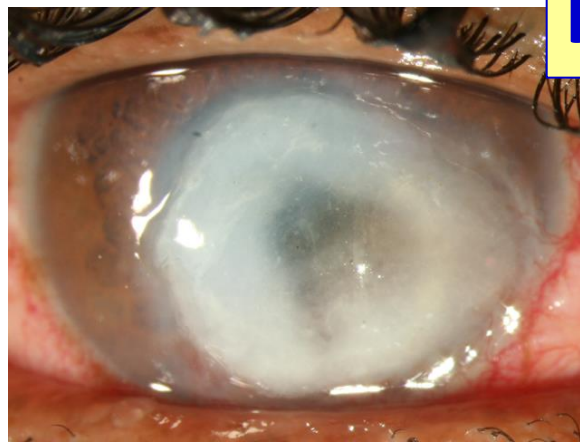
- Infectious Keratitis (Corneal Ulcer)
- Pseudophakic Bullous keratopathy
- Hereditary Dystrophies/ Corneal Ectasia
- Corneal Injury: open globe/chemical/thermal
- Trachoma
- Vitamin A deficiency

Infective keratitis: in India

Madurai: 113/ 100,000 person/yr



India: 1.31 million ulcers/year

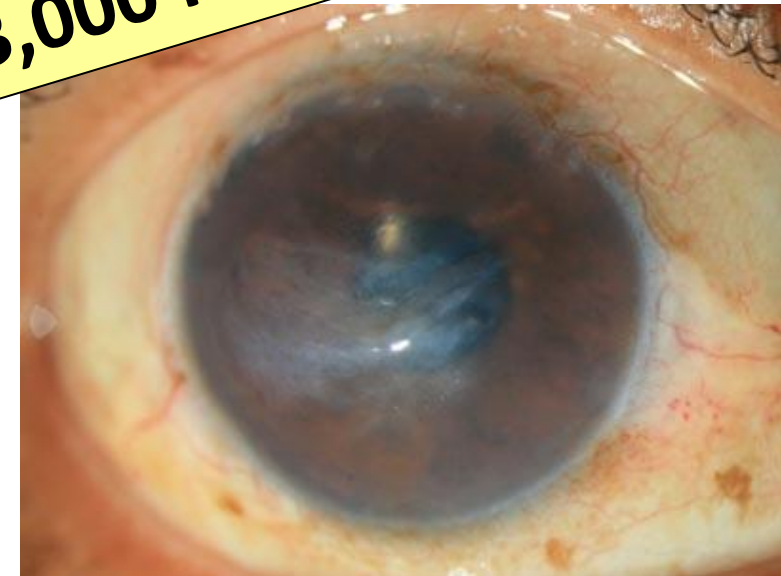


Pseudophakic Bullous Keratopathy (PBK)

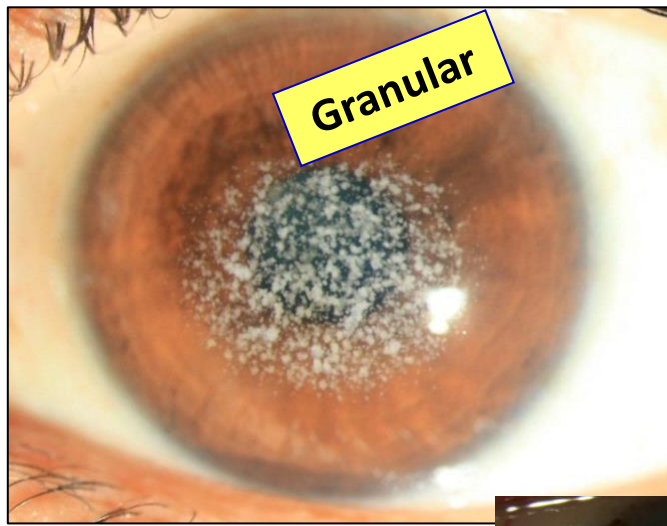
- **Exact data not available**
- Incidence = 0.1-1.0%
 - ✓ PBK occurs both from Masters and Learner
- **In 2012-13 = 6.4 million** Cataract Sx performed by us
- **In Simple Math: @ 0.2% =**
the **FIGURE** of PBK/edema = ?



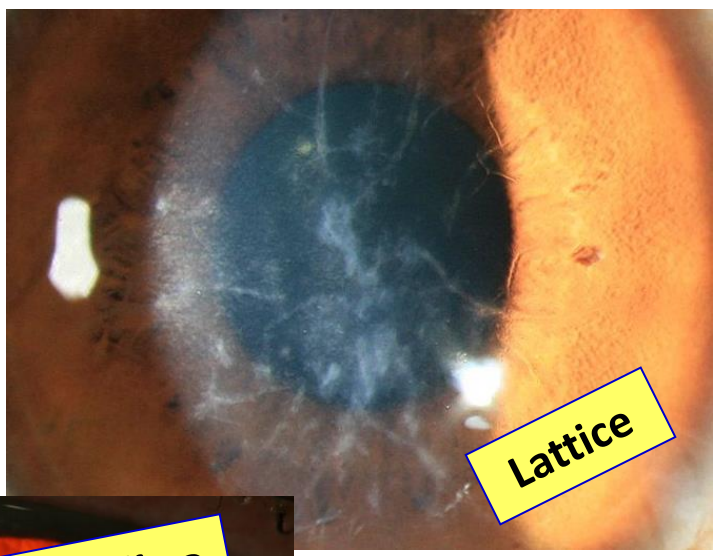
13,000 PBK/Year



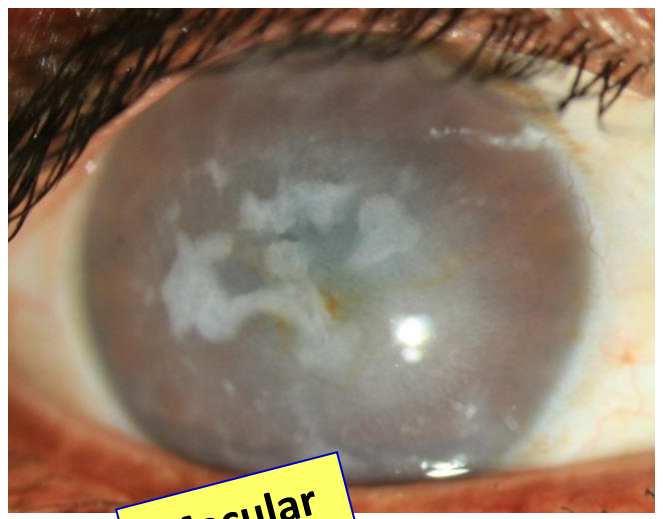
Hereditary Dystrophies



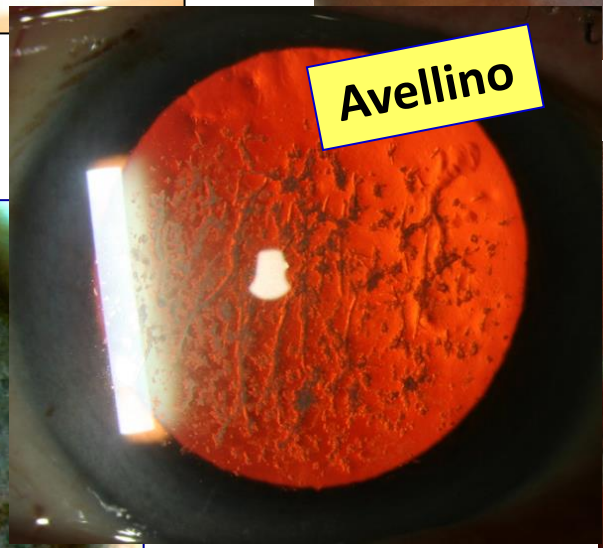
Granular



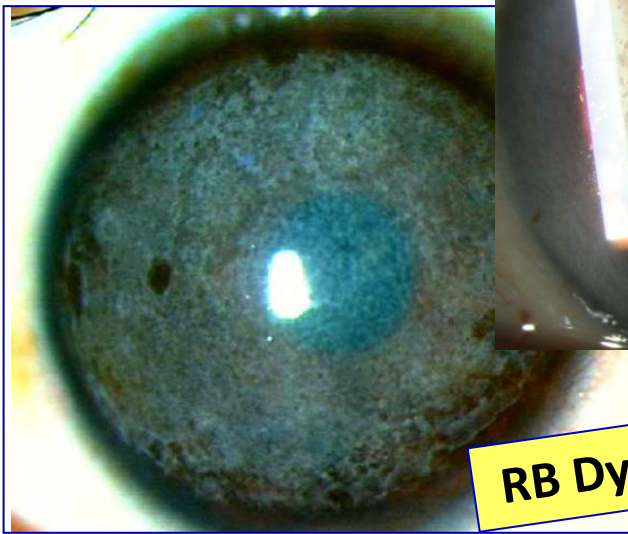
Lattice



Macular



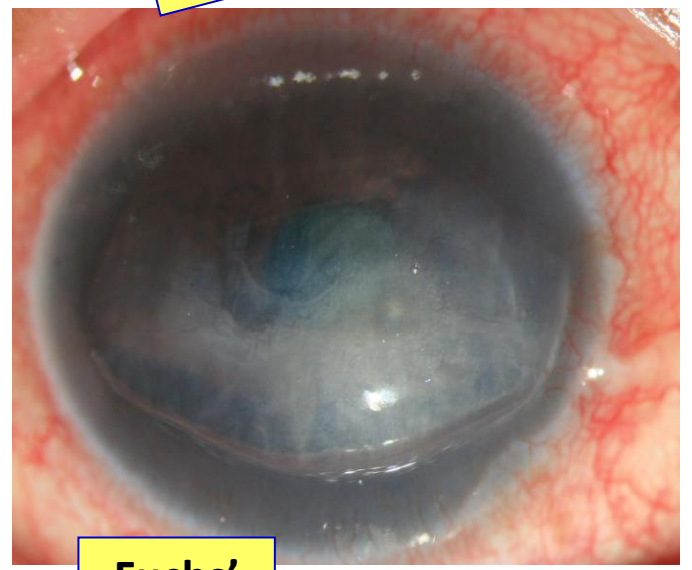
Avellino



RB Dyst

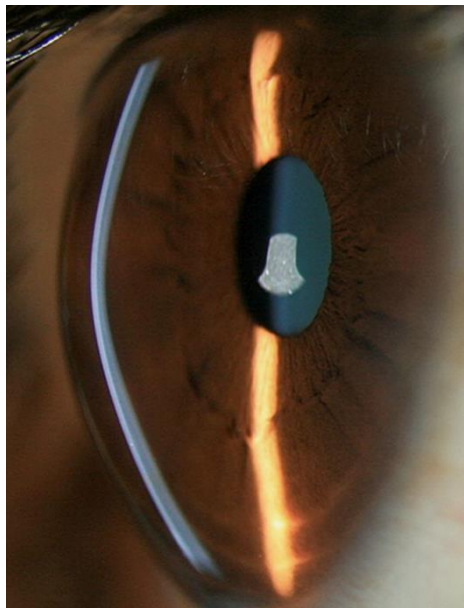


CHED

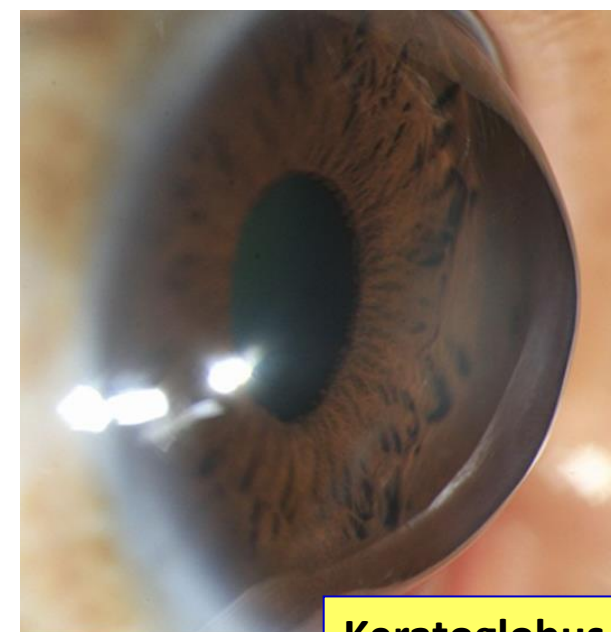
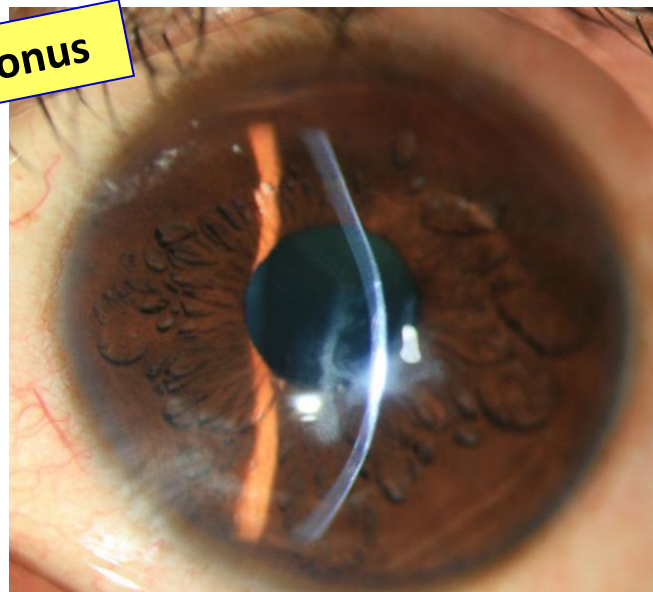


Fuchs'

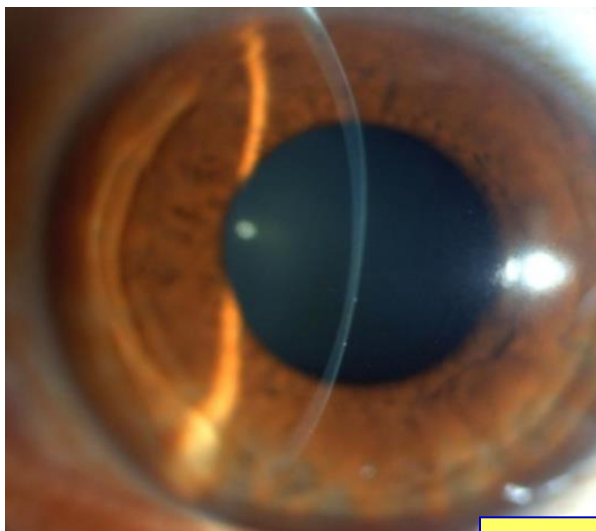
Corneal Ectasia: **More detection**



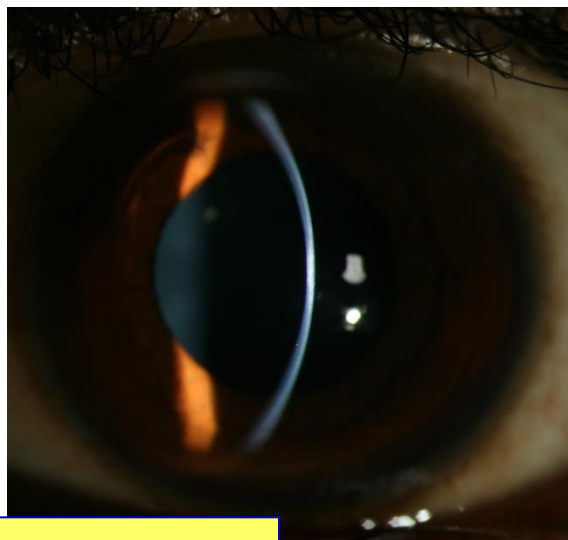
Keratoconus



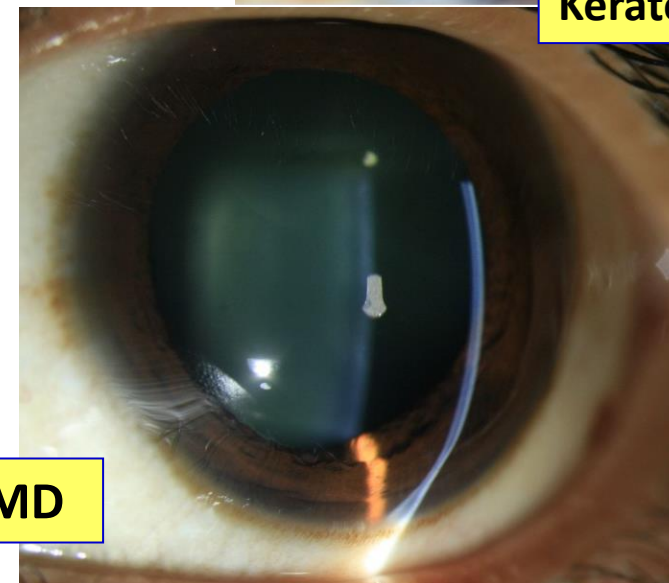
Keratoglobus



Post LASIK Ectasia



PMD



KCN: Global and Indian data

- **Prevalence = 50 to 130 per 100,000 population.**
- Overall **Annual incidence = 2.0 per 100,000**
- **In last decade – More newly diagnosis of KCN**
 - ✓ Better diagnostic sensitivity - especially with increase topography use
 - ✓ Newly identified KCN cases during Screening for LASIK

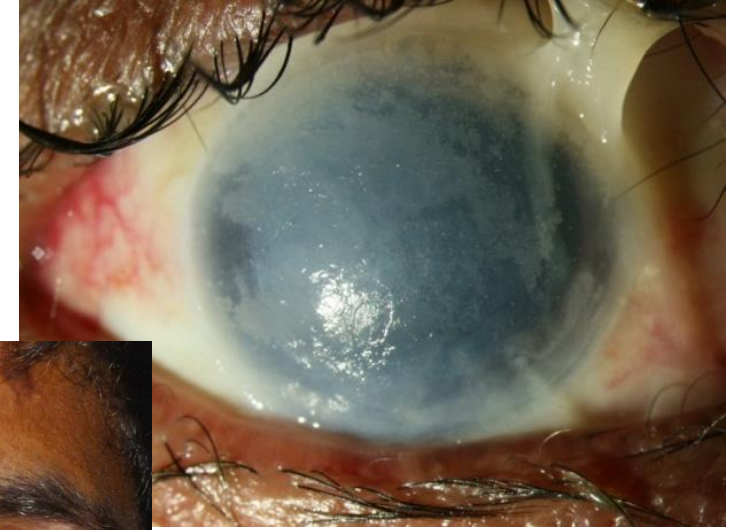
India = 2,300 per 100,000 population !!

Kymes SM and The Collaborative Longitudinal Evaluation of Keratoconus (CLEK) Study Group. Quality of life in keratoconus. Am J Ophthalmol. 2004;138:527-35.

Jonas B et al. Prevalence and associations of keratoconus in rural Maharashtra in central India: the central India eye and medical study. Am J Ophthalmol. 2009;148:760-5

Injury: Open globe and Chemical

- Everyday we see such cases
- Open globe and Alkali burns more common in children
- Gen-X ophthalmologists
 - ✓ are not interested –
 - ✓ not learning good suturing
- Complacence attitude
- **Delayed intervention** leads to permanent visual loss



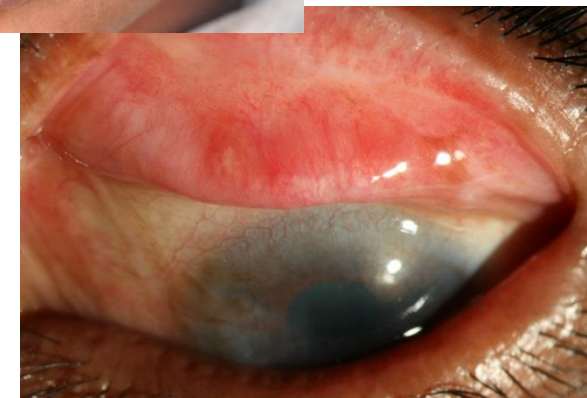
Trachoma: Coming Back !

- In 84-87 NPCB-WHO Survey = 3%
- In 2001-2005 = **No active** Trachoma
- In 2010-11 : New areas
 - ✓ Uttarakhand = 15.2%
 - ✓ Haryana
 - ✓ Gujarat
 - ✓ Punjab
 - ✓ Rajasthan = 7.6%
 - ✓ UP = 5.9%



Eye Seeking Flies

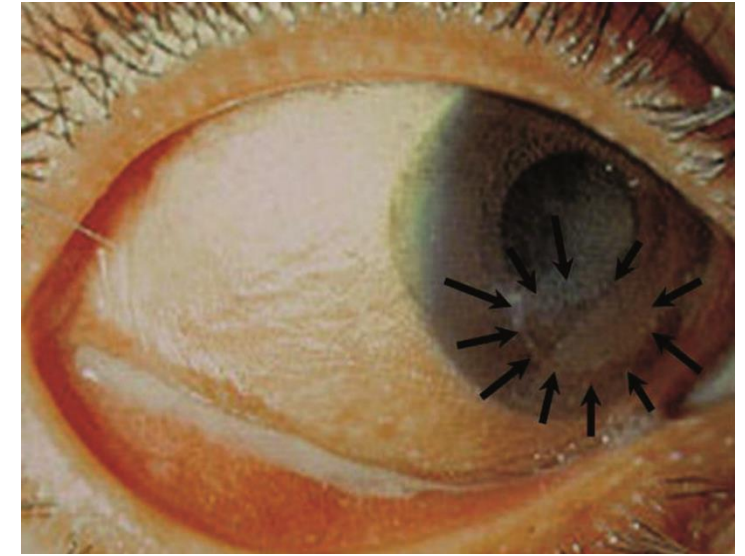
Musca Sorbens



RAAB Study NPCB
< 10 years age

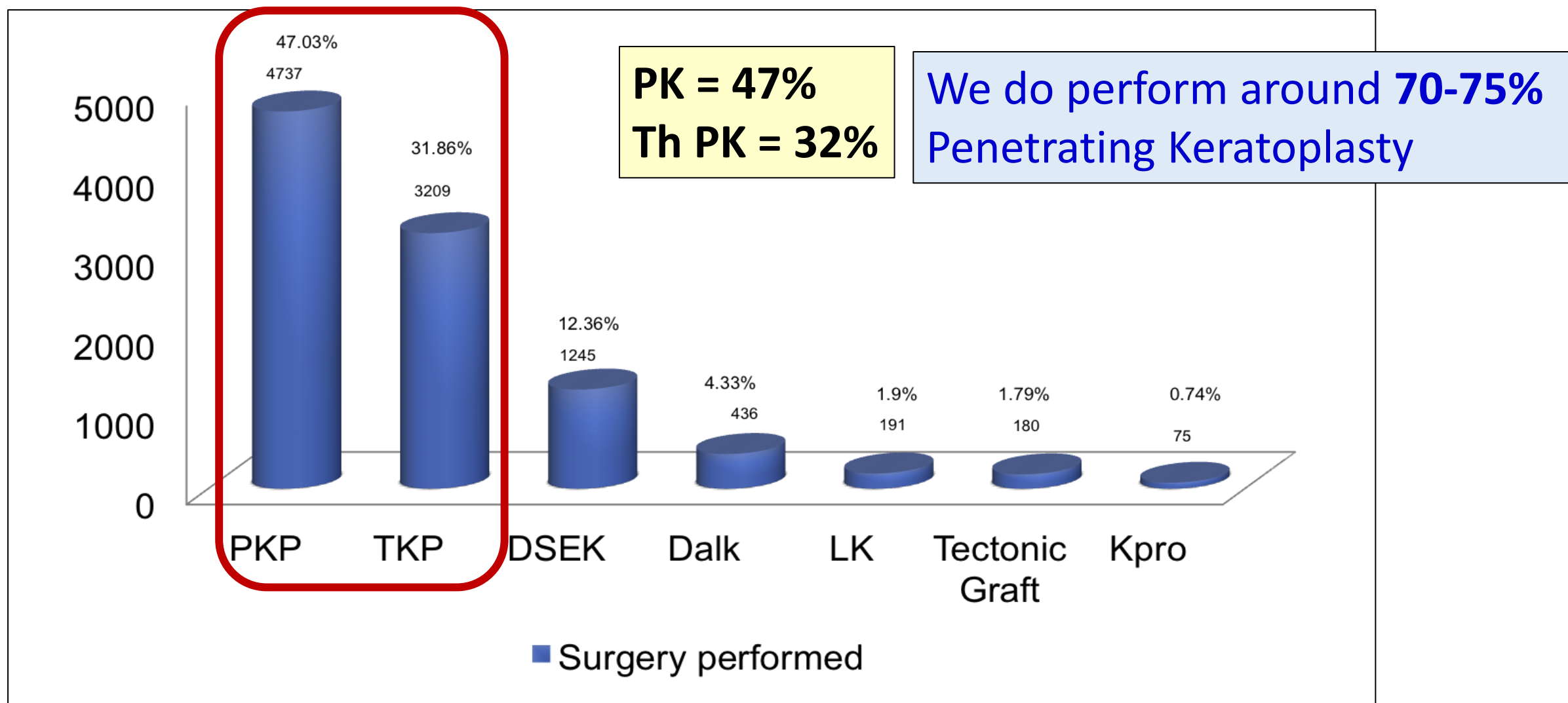
Vitamin A deficiency

- **Now: not a problem**
- Good coverage with Mass Immunisation
- **Cluster problem is still there** along with PEM

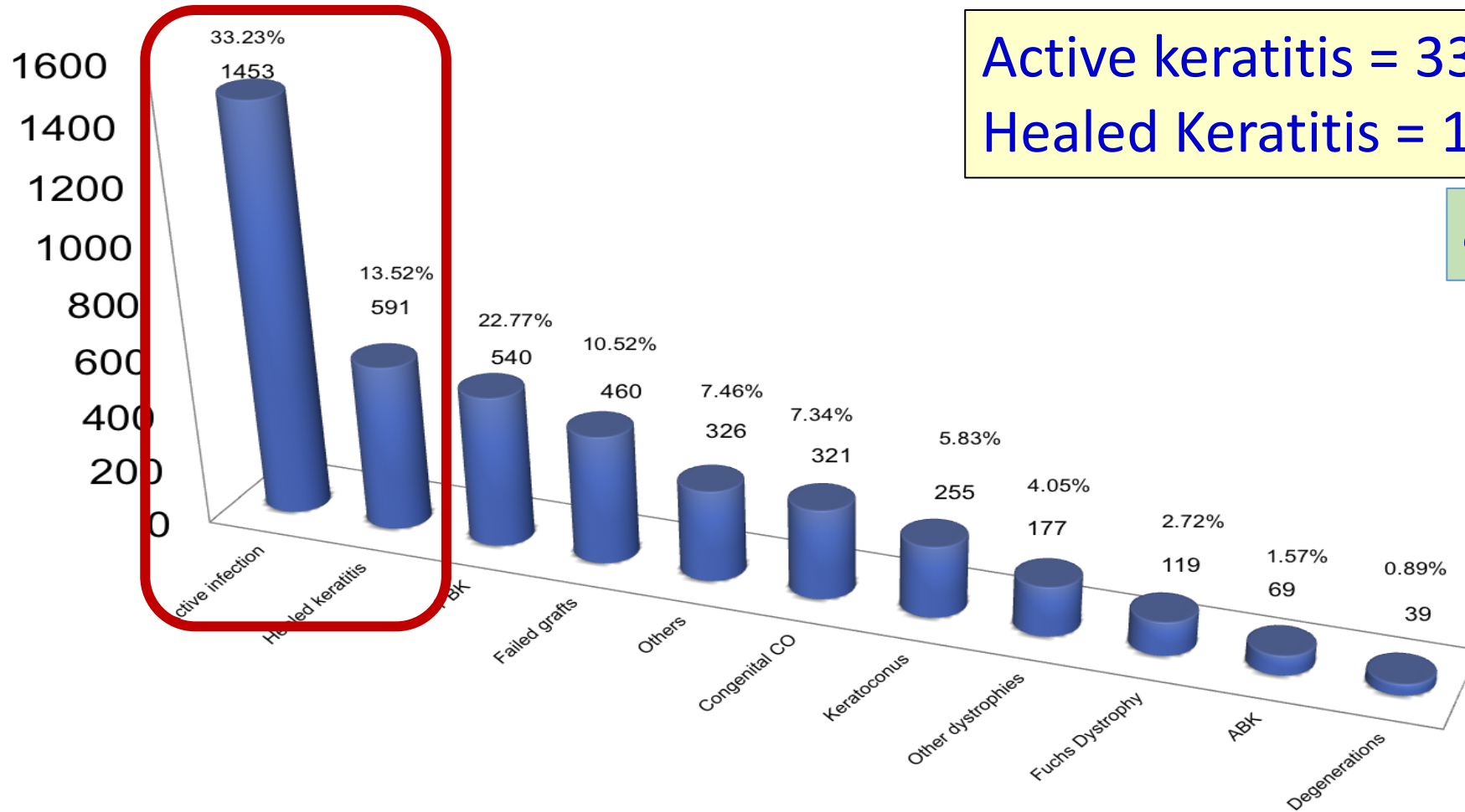


Keratoplasty: 23,000+ in INDIA

Surgery-wise Types – Top 10 Eye Banks # Compiled data (2013-14)



Indications for Tx: Top 10 Eye Banks # 2013-14

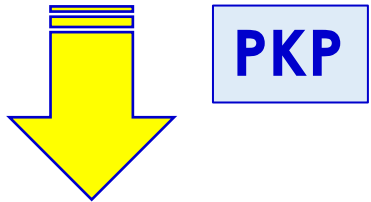
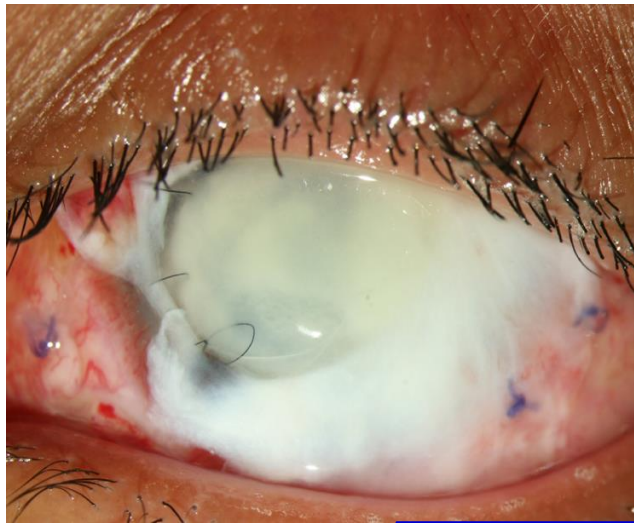


Active keratitis = 33.23%
Healed Keratitis = 13.52%

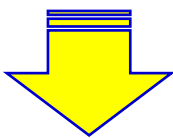
47%

■ Number of patients

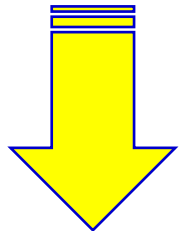
N = 4372



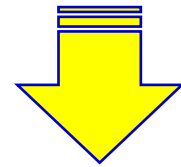
PKP



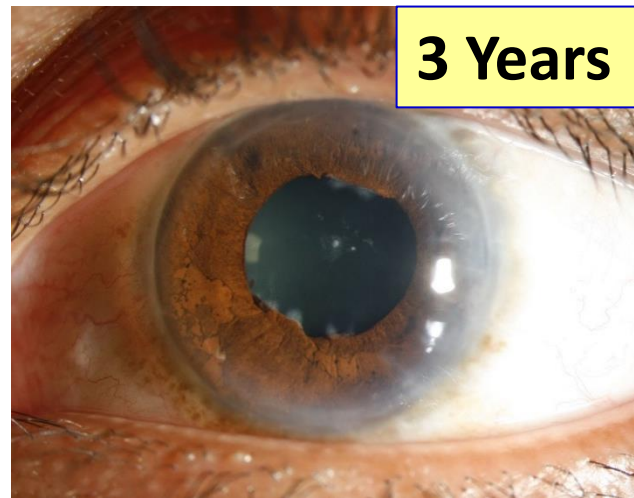
Th PKP



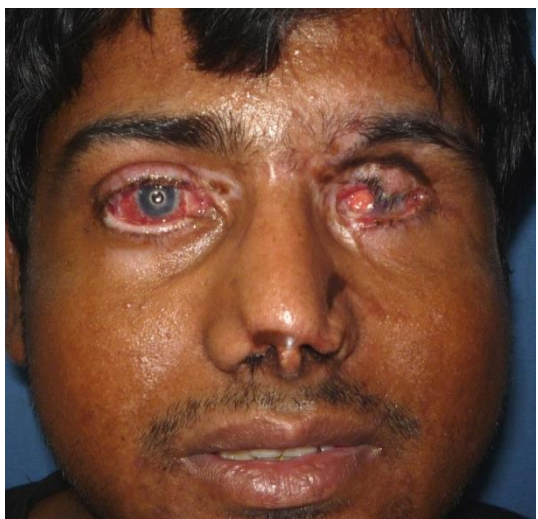
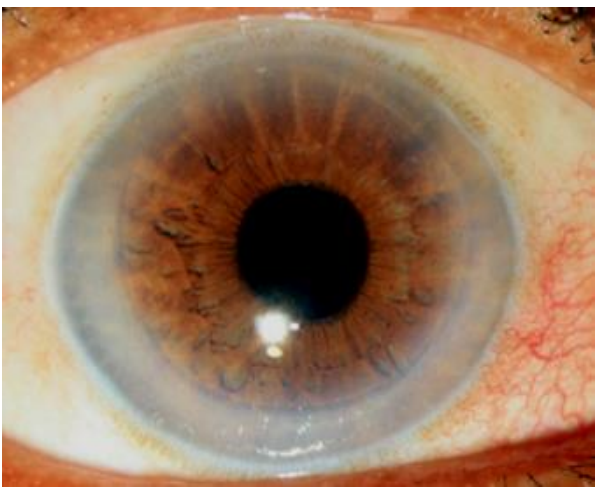
DSEK



KPro



3 Years



Eye Banking in India

Eye Banking: **All INDIA (Last 10 yrs)** 2003-13/14

- Our collection has improved from = **20,451 to 50,000 +**
- And Utilization from = **8,014 to 23,015**
- Utilization percentage improved from **34% to 48%**

As per Vision2020 India:

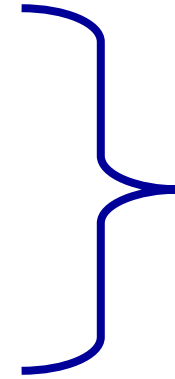
We Need to perform = 100,000 Keratoplasty/Year in the year 2020

@ 50% utilization

We need Collection = 200,000 Cornea/year

Eye Banking scenario : **INDIA**

- Eye Bank Training Centre (EBTC) = 8
- Eye Bank (EB) = 223
- Eye Donation Centre (EDC) = 477



708

- No. of Active Eye Bank/EDC (>50/year) = 240
- Eye Banks/EDCs collect > 100 eyes/year = 58
- **Eye Banks collect >1000 eyes/year = 15**

Indian Eye Banking # **Target**

What we have achieved so far

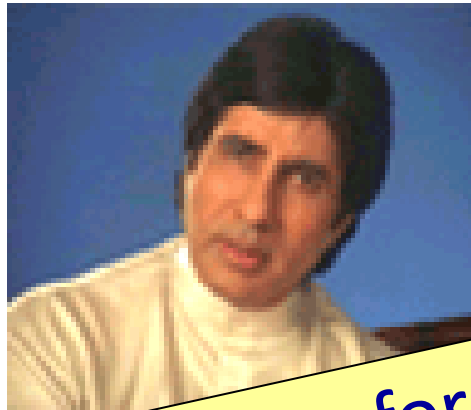
- Based on 10.2 million deaths in 2013-14:
- ✓ In 2013-14, **Total collections = approx. 0.5% of all deaths**

- With a goal of **100,000 transplants** and **utilization of 50%** -
Target of consenting donors = 100,000/year

We need cornea from = 1% of Total deaths

Eye Donation Education in India

Eye Donation Education is satisfactory in India



Celebrity's campaign and Pledge for eye donation

Prior Pledge for Eye Donation after death - **Plenty**

Previously -

Only source of Eye Donation: India

from home death = Voluntary

99 %

**Voluntary Donation
without prior pledge**

01 %

**Voluntary Donation
after prior pledge**

Nothing like – “Presumed consent” law

Now **H C R P** – a growing concept

Hospital **C**ornea **R**etrieval **P**rogram

- **The Key:** Direct Motivation of the family members of the deceased actively by **Professionally-trained counselor**, called **Eye Donation Counselor (EDC)** in a Hospital setting where the death rate is high.
- They approach family members **in the Hospital** immediately after death of the family's loved one; **brief them about eye donation and then request** for giving consent for donation.

HCRP # as PPP Model

- HCRP is typically a **Public Private Partnership (PPP) Model** between the eye bank (an NGO) and a large Government hospital.
- With the help and support of all level hospital-staff - the **Consent rate is between = 5 - 65 %**
- Currently, >25 eye banks in the country have adopted this concept
- With the help of Central and State Government, **more than 50 HCRP centres across the country.**

Model HCRP: Needs Professional approach

SightLife partner EBs (12) : HCRP Vs Voluntary

Year	2011	2012	2013	
HCRP = Collection Vs Utilization				
HCRP Collection	4212	5058	7502	
HCRP Utilization	2900 (69%)	3688 (73%)	5710 (76%)	
Voluntary = Collection Vs Utilization				
Voluntary Collection	8082	8891	8076	
Voluntary Utilization	4441 (55%)	4623 (52%)	4135 (51%)	

Perfect Example of PPP Model

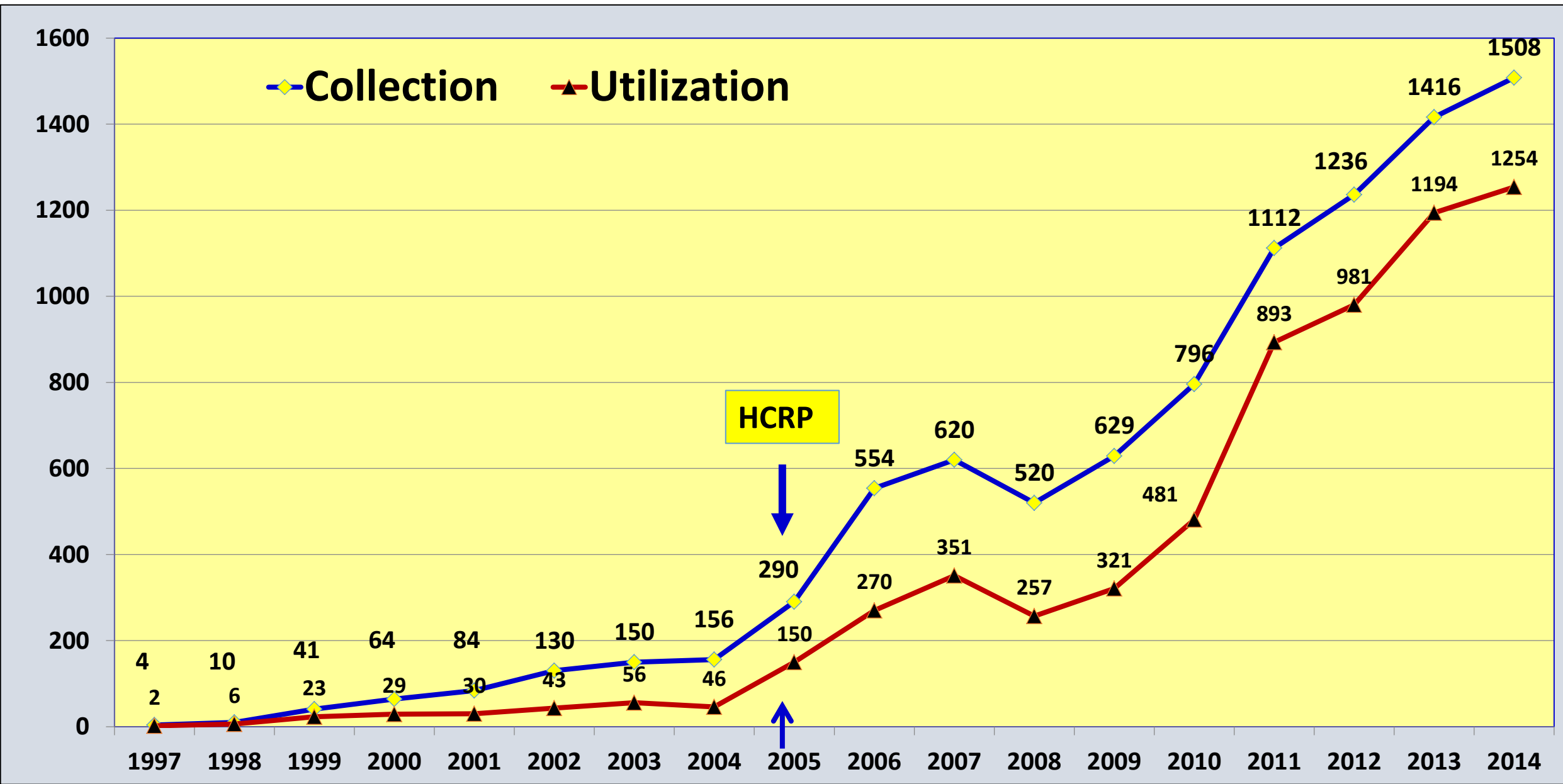
PEB **H C R P**: in Govt Medical College &
Hospital

A Paradigm Shift

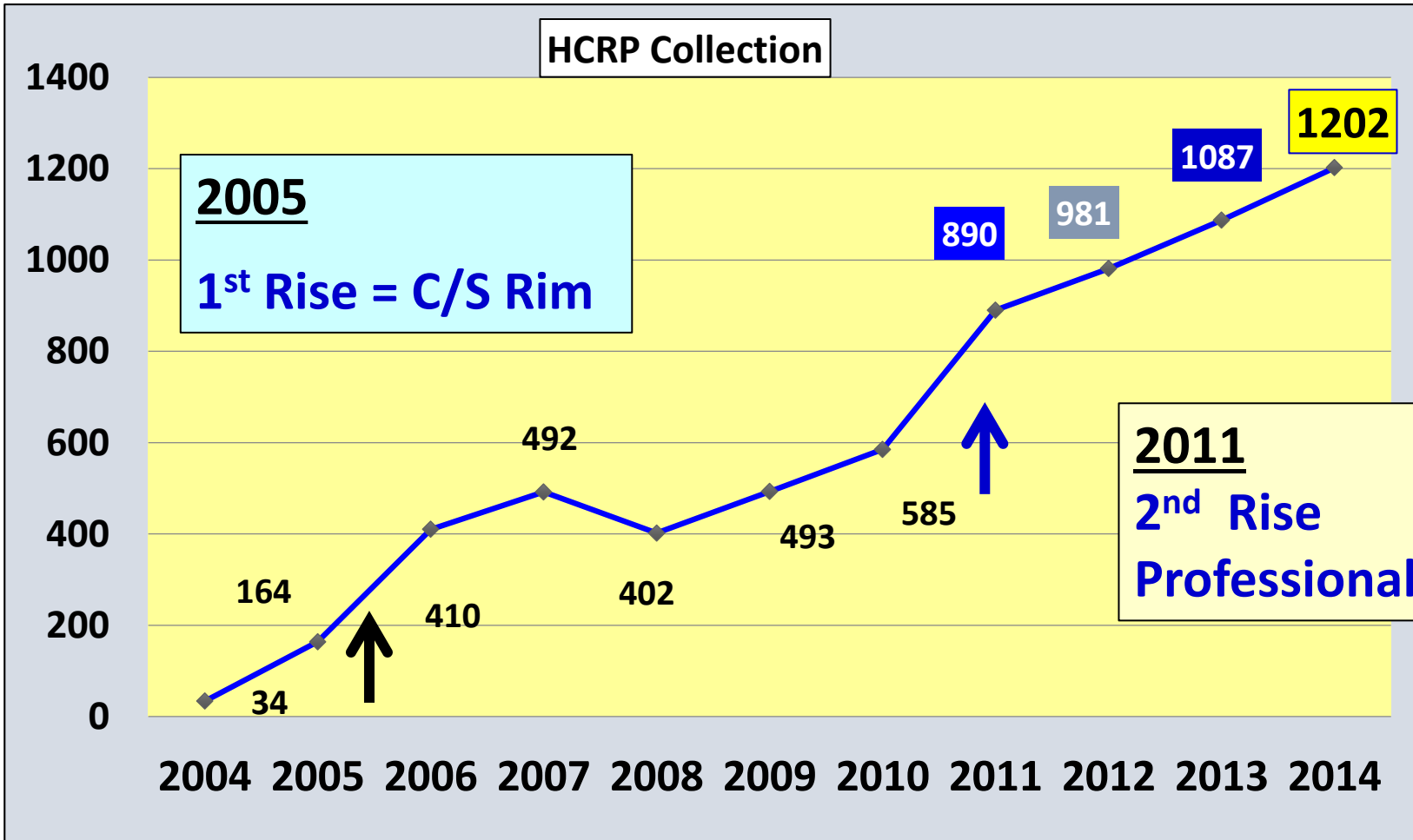
HCRP = 75-80%

Voluntary = 20-25%

Total Collection Vs Utilization # PEB



Model HCRP: PPP # Example (PEB)



Consent rate

- 2005 = 7.8%
- 2010 = 22.7%
- 2014 = 36.6%.

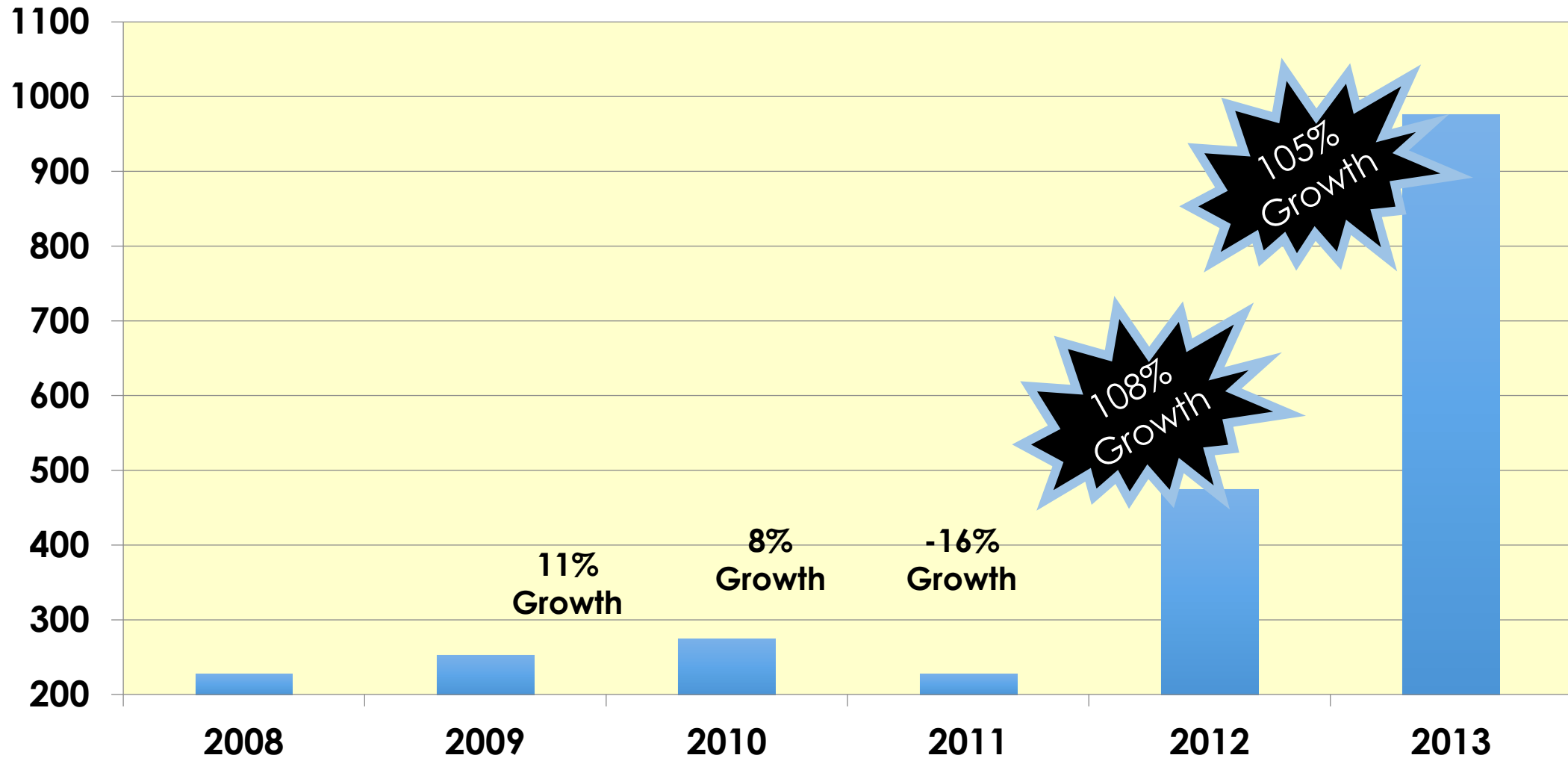
Number of EDC

- 2005 = 4
- 2010 = 5
- 2014 = 8

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Cornea	34	164	410	492	402	493	585	890	980	1087	1202	6726

H C R P : Another Success Story # **Delhi Model**

HCRP Transplants – Delhi, India



Donor Quality # Voluntary Vs HCRP (2008-2012)

Cornea Grading	No of Cornea		Percentage				p value
	Voln	HCRP	Voln	HCRP	HCRP		
Excellent	64	518	5.9%	16%	15%	41 %	<0.01
Very Good	115	894	10.6%		26%		<0.01
Good	272	746	25%		21.6%		NS
Fair	255	729	23.4%		21.2%		NS
NSFS*	353	470	32.5%		13.6%		<0.005
Sero +ve	28	104	2.6%		2.9%		NS
Total	1087	3461	100%		100%		

*NSFS = Not Suitable For Surgery

More HCRP = More younger donor

Year	0-20 yrs		21-40 yrs		41-65 yrs		>65 yrs		Total
2004	Nil		Nil		12		144		156
	VOL	HCRP	VOL	HCRP	VOL	HCRP	VOL	HCRP	Total
2005	Nil	Nil	6	10	14	48	102	120	290
2006	0	2	4	40	22	112	102	256	554
2007	6	6	6	46	12	120	104	322	622
2008	0	6	4	38	08	94	98	292	542
2009	0	8	2	54	12	142	104	330	642
2010	0	12	4	68	30	165	146	361	786
2011	2	10	2	56	14	280	202	544	1112
2012	0	8	4	64	28	322	226	584	1236
2013	0	14	2	114	31	438	298	538	1416
Total	8	52	32	376	112	1283	1028	3341	5784

**Last 9 Years:
≤65 Yrs = 2490**

Volun = 213 (8.7 %)

HCRP = 2273 (91.3%)

**Utilization
increased *from*
52% to 84%**

Efficient HCRP

Maximum Utilization

More Revenue for the Eye Bank

Self sustainable

Scope for Growth

Some other Key issues with Indian Eye Banking

Some Key issues

- Legal issues, some favourable changes in Tissue ACTs – happened
- Collection/utilization-data related issues, – we are trying
- Quality, Monitoring, Accreditation – on the process
- Uniform Cornea distribution system – EBAI-SightLife project is on...
- Government Sector Eye Banking and Transplants – issues are there.
- State-related issues – (No Eye Bank; No surgeon, No keratoplasty)
- More Corneal Surgeon, Corneal Surgery and Follow/Up issues

We need 3-tier Eye Banking & Net working



One Eye Bank per 20 million population

5 EBTC + 45 EB = 50

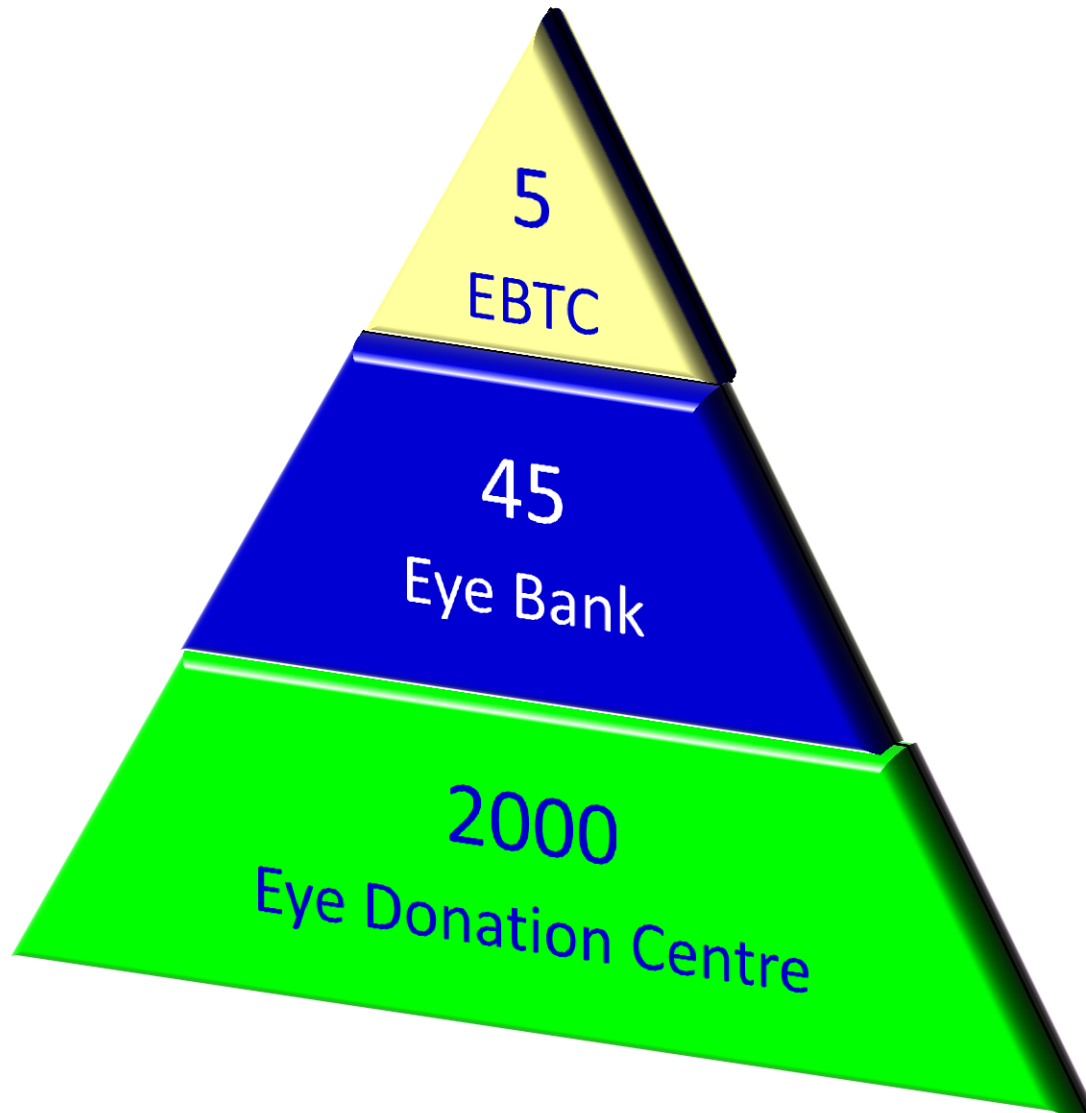
4000 corneas /EB/year
= 200,000 cornea/year

40 EDC per EB (2000)

Each EDC = 50 cornea/ yr
2000x50 = 100,000/year

10 HCRP's per EB (500)

Our Optimistic (Magic) Figures in 2020



200,000 cornea

= 100,000 utilization

By the year 2020

1000 Corneal surgeon

Each Surgeon =

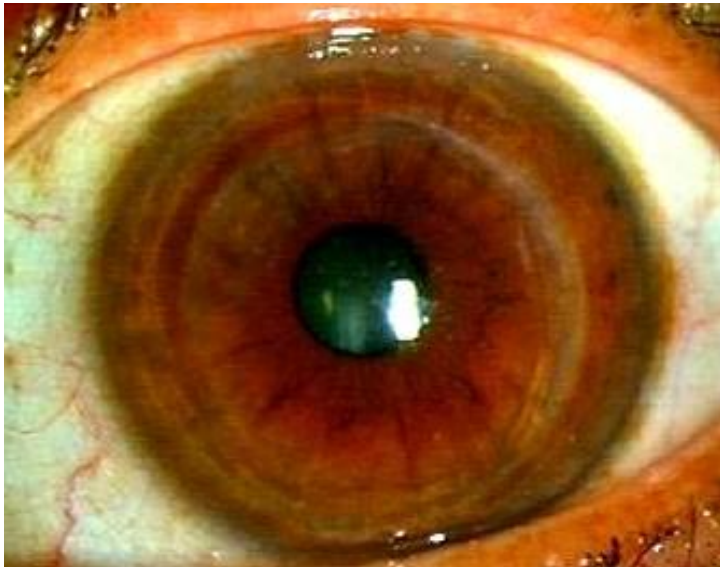
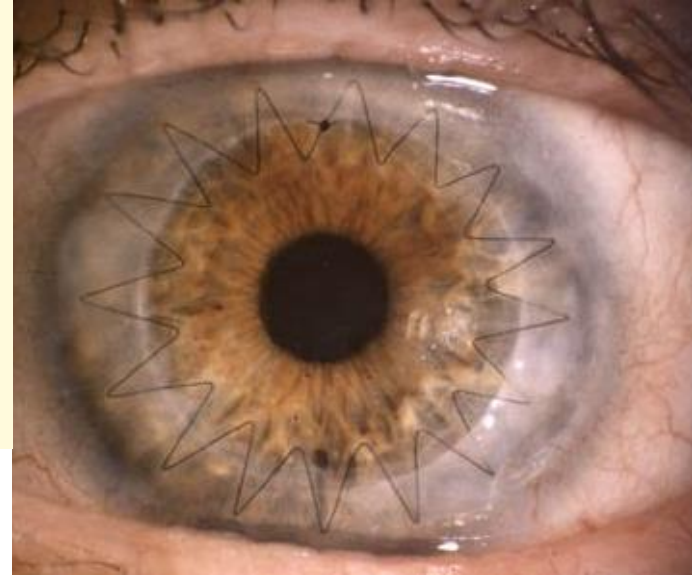
100 transplant/year



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Highly possible # to reach our GOAL by 2020 !



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