

Prevalence of diabetic retinopathy & sight threatening diabetic retinopathy in Hong Kong.

Are we more or less at risk?



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Introduction

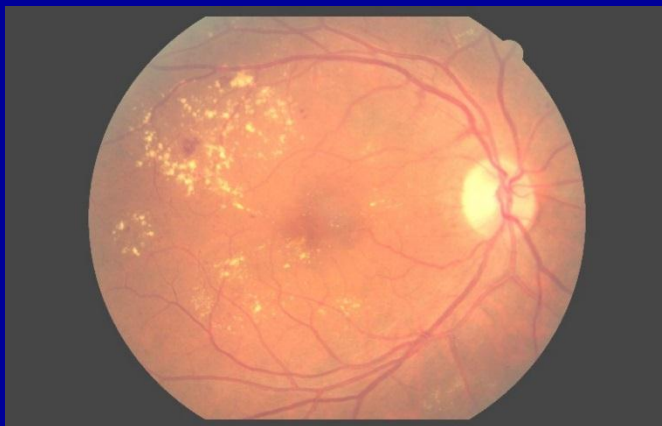
- Diabetic retinopathy (DR) : a leading cause of blindness in working age individuals
- Advanced and irreversible DR may be asymptomatic
- Timely detection is essential to prevent blindness
- Timely laser treatment can preserve vision in subjects with sight threatening DR (STDR)



Visual acuity is misleading..



VA = 6/9



VA =
6/12



Objective

- To detect prevalence of DR and STDR in
 - Hong Kong (HK) as a whole &
 - in different clusters in HK and
- to compare with the global prevalence rate of DR



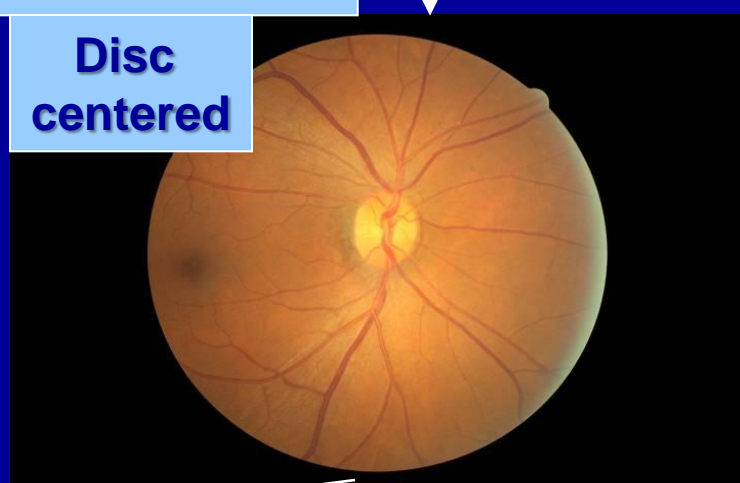
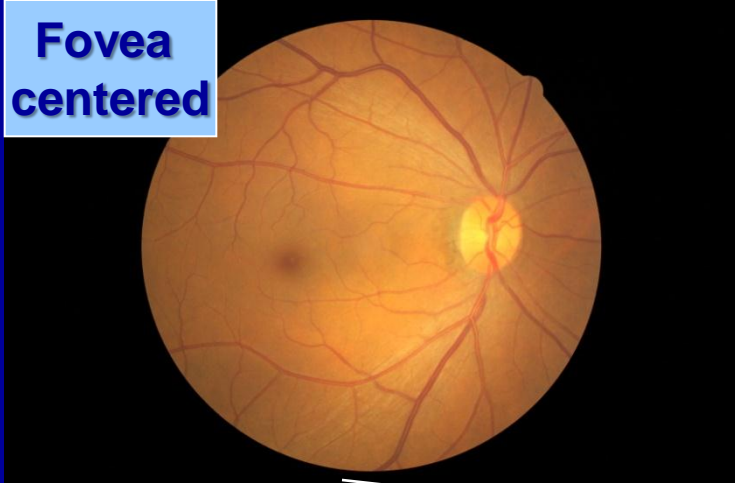
Methods

- Screening at primary care outpatient clinics under the 'Risk Assessment and Management Programme (RAMP)'
- Examination of :
 - visual acuity,
 - anterior segment examination,
 - dilatation of pupils,
 - digital retinal fundus photographyby trained optometrists.

The Screening process



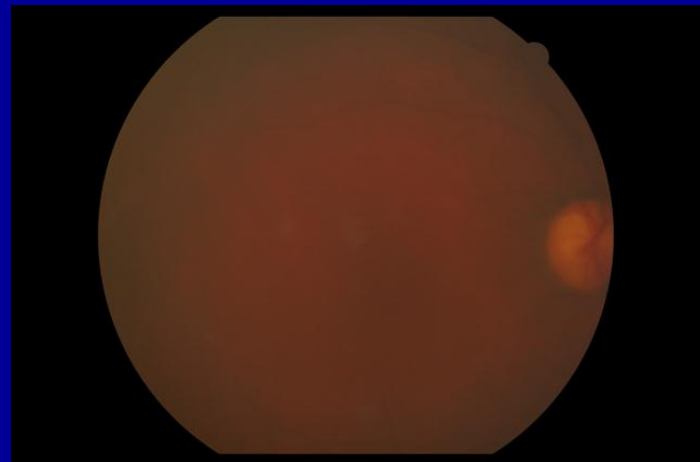
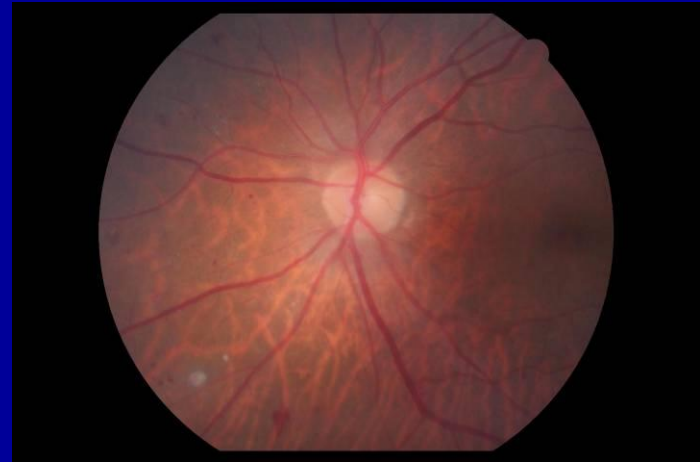
2 views of retina



Grading of fundus photo for +/- and severity of DR

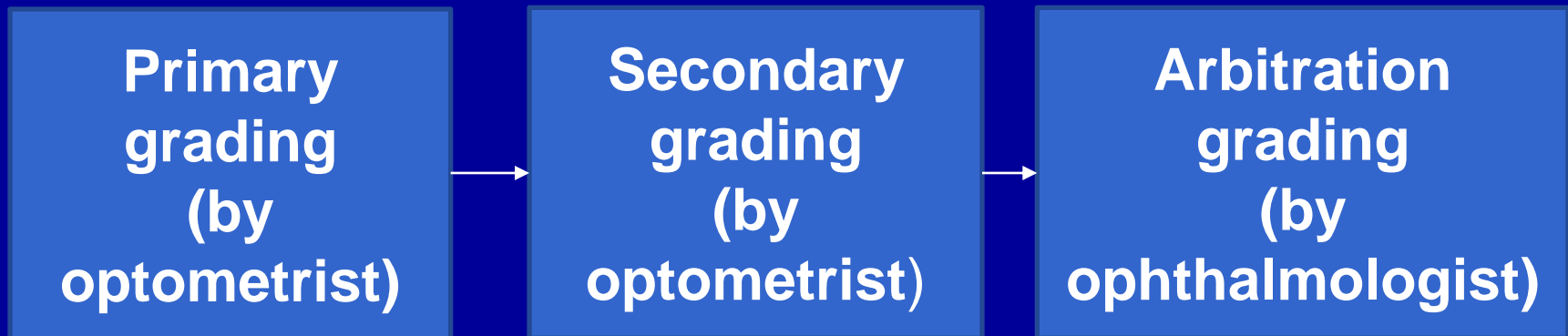
Grading Protocol

- Image Quality
- Artifacts
- Severity of the disease
- Other eye diseases
- **Arbitration**
- **Quality Assurance**



Methods...contd..

- Systematic grading of fundus photographs for grades of DR according to the English national screening programme.



GRADES OF DR:

- No DR
- Background/ Non- proliferative DR
- Pre-proliferative DR
- Proliferative DR
- Maculopathy

STDR (sight threatening DR)

Diabetic Retinopathy Grading Standard

Grading	International Term	Features	Action
R0	No diabetic retinopathy	Normal retina	Annual screening
R1	Mild non-proliferative diabetic retinopathy	Hemorrhages and micro aneurysms only	Annual screening
R2	Moderate non-proliferative diabetic retinopathy	Extensive micro aneurysms (MAs), intraretinal hemorrhages, and hard exudates	Appt within 13 weeks
R2	Severe non-proliferative diabetic retinopathy	Venous abnormalities, large blot hemorrhages, cotton wool spots (small infarcts), venous beading, venous loop, venous reduplication, and IRMA	Appt within 13 weeks
R3	Proliferative diabetic retinopathy	New vessel formation either at the disc (NVD) or elsewhere (NVE).	Appt within 2 weeks
R3	Pre-retinal fibrosis ± tractional retinal detachment	Extensive fibro vascular proliferation, retinal detachment, pre-retinal or vitreous hemorrhage, glaucoma and subhyaloid hemorrhage	Appt within 2 weeks
M0	No maculopathy	No maculopathy	Annual screening
M1	Maculopathy	Exudative : leakage, retinal thickening, MAs,HEs Ischemic : featureless macula with NVE and poor VA Milder forms: <ul style="list-style-type: none"> ●exudate ≤1DD of centre of fovea ●circinate or group of exudates within macula ●any MAs or hemorrhage ≤1DD of centre of fovea only if associated with a best VA of ≤ 6/12 ●retinal thickening ≤1DD of centre of fovea 	Appt within 13 weeks
P	Photocoagulation	Small retinal scars through out the peripheral retina.	Appt < 2 weeks
U	Un-gradable	Ungradable : cataract or other lesions -referred for assessment	Appt < 4 weeks

International Council of Ophthalmology

Diabetic Retinopathy grading (2014)

Diabetic Retinopathy	Findings Observable on dilated ophthalmoscopy	Referral
No apparent retinopathy	No abnormalities	Review in 1-2 years
Mild nonproliferative DR	Microaneurysms only	Review in 1-2 years
Moderate nonproliferative DR	More than just microaneurysms, but less than severe nonproliferative DR	Review in 6 months -1 year; or refer to ophthalmologist
Severe nonproliferative DR	Any of the following: <ul style="list-style-type: none"> • Intraretinal hemorrhages (≥20 in each quadrant); • Definite venous beading (in 2 quadrants); • Intraretinal microvascular abnormalities (in 1 quadrant) • and no signs of proliferative retinopathy 	Refer to ophthalmologist
Proliferative DR	Severe nonproliferative DR and 1 or more of the following: <ul style="list-style-type: none"> • Neovascularization • Vitreous/preretinal hemorrhage 	Refer to ophthalmologist

Results

**Total No of subjects screened:
N= 145888
(Nov 2009-Aug 2013)**

**Ungradable photos:
N= 8151 (5.6%)**

**Prevalence of DR (any DR) =
40.1% (95% CI: 39.9-40.4)**

**Prevalence of DR (different
clusters) = 33.4%-49.8%**

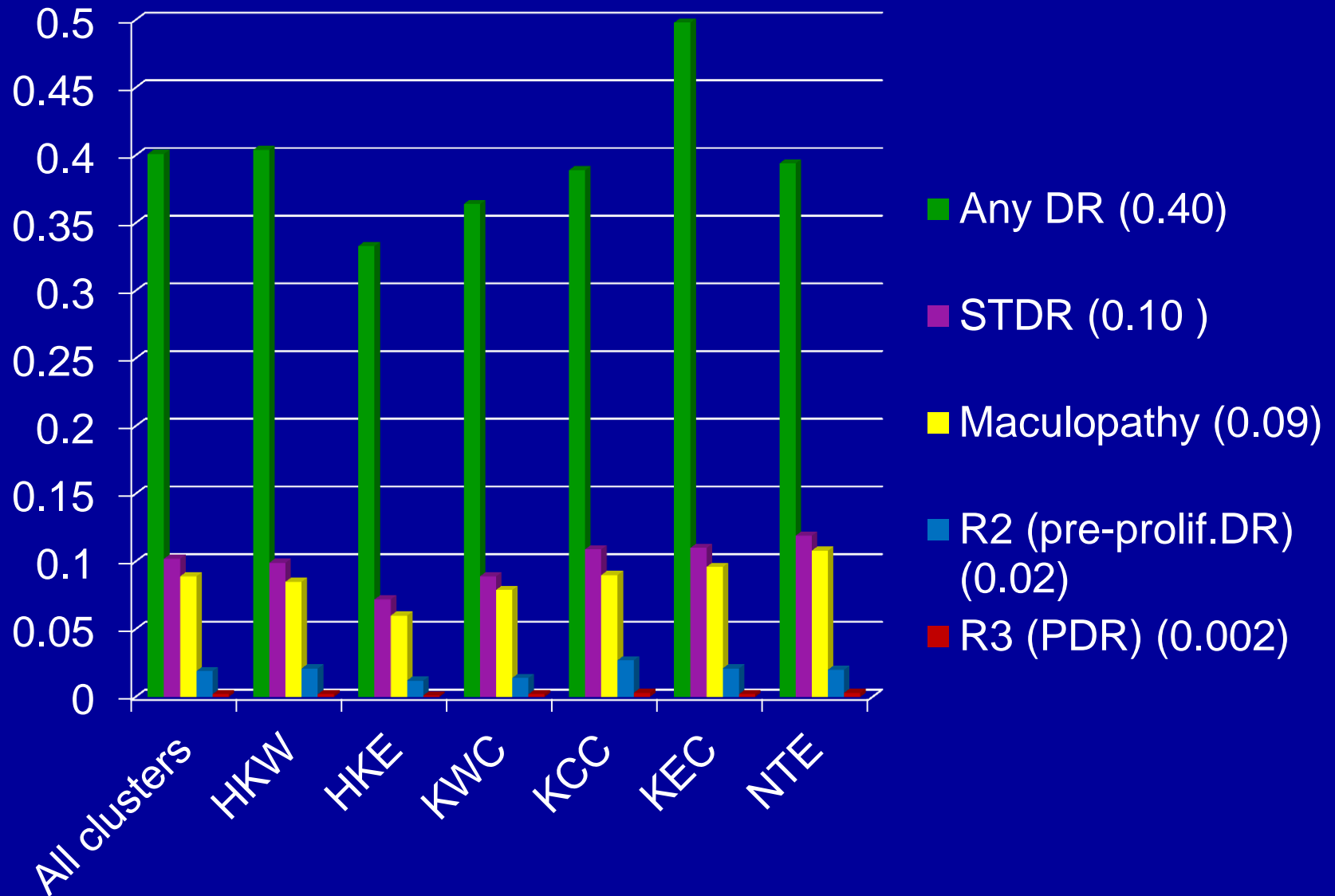
**Prevalence of STDR =
10.2% (95% CI: 10.0-10.3)**

**Prevalence of STDR
(different clusters) =
7.3%-11.9%**

**Prevalence of maculopathy =
8.9% (95% CI: 8.8-9.0)**

**Prevalence of maculopathy
(different clusters) =
8.0%-10.1%**

Results



Are we more or less at risk?

Prevalence	Hong Kong % (95% CI)	Global prevalence [1]
Any DR	40% (39.9-40.4)	34.6% (34.5-34.8)
STDR/VTDR	10.2% (10.0-10.3)	10.2% (10.1-10.3)
Maculopathy	8.9% (8.8-9.0)	6.81% (6.74-6.89)
PDR	0.3% (0.20-0.38)	6.96% (6.87-7.04)

[1] Yau JW, Rogers SL, Kawasaki R, et al. Global prevalence and major risk factors of diabetic retinopathy. Diabetes Care 2012;35(3):556-64.

Are we more or less at risk?

Prevalence	Hong Kong % (95% CI)	Global prevalence [1]
Any DR	40% (39.9-40.4)	34.6%(34.5-34.8) Caucasian: 45.8% African-American: 49.6% Hispanic: 34.6% Chinese:25.1% Asian: 19.9%
STDR/VTDR	10.2% (10.0-10.3)	10.2%(10.1-10.3)
Maculopathy	8.9% (8.8-9.0)	6.81% (6.74-6.89)
PDR	0.3% (0.20-0.38)	6.96%(6.87-7.04)

Conclusions

- The overall prevalence of DR in Hong Kong was 40%
- The prevalence of STDR was 10.2%.
- The prevalence of maculopathy was slightly higher than global prevalence (7.5%)- Screening methodology
- The prevalence of proliferative DR was $< 1.0\%$ in our population as compared to the global prevalence of 7.0%
- There was little variation in DR or STDR between clusters.

Conclusion...

- The screening programme under 'RAMP' was more objective method to assess DR – truly worthwhile
- An integral system with 'Arbitration and Quality assurance'
- Traceable and with an ability to detect progression on subsequent screening episodes
- This could not have been achieved without RAMP other than direct ophthalmoscopy
- Screening and grading less labor intensive than examining with direct ophthalmoscopy

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Thank you