

# Diabetes Mellitus and Diabetic Retinopathy – An Overview

MOH Diabetic Retinopathy  
Screening team  
2012



# Scope of presentation

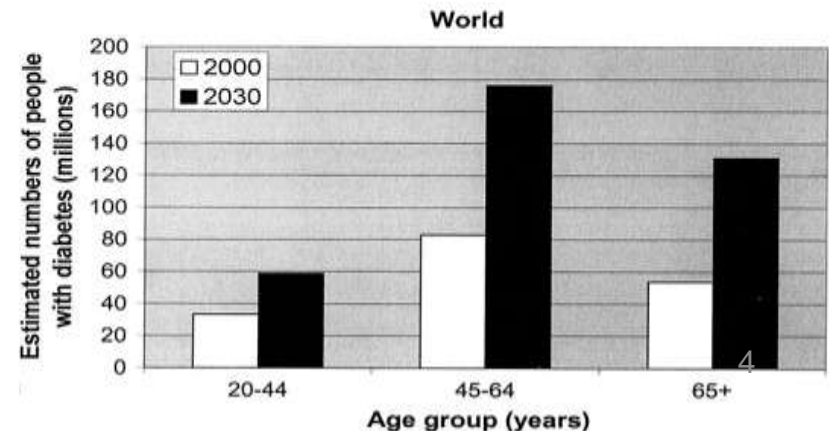
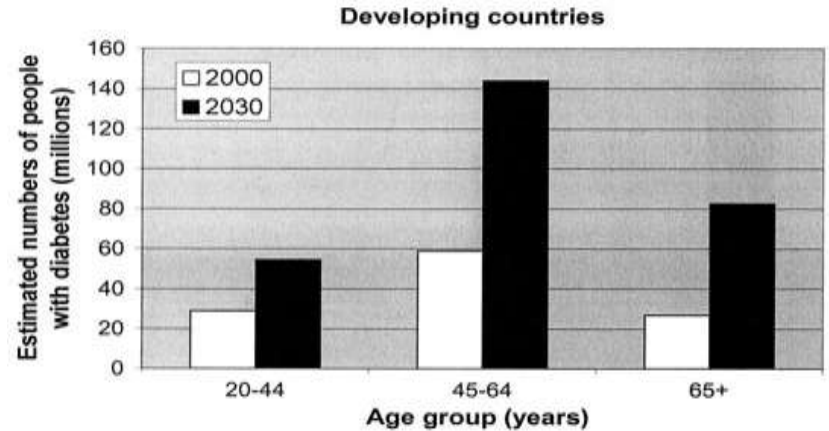
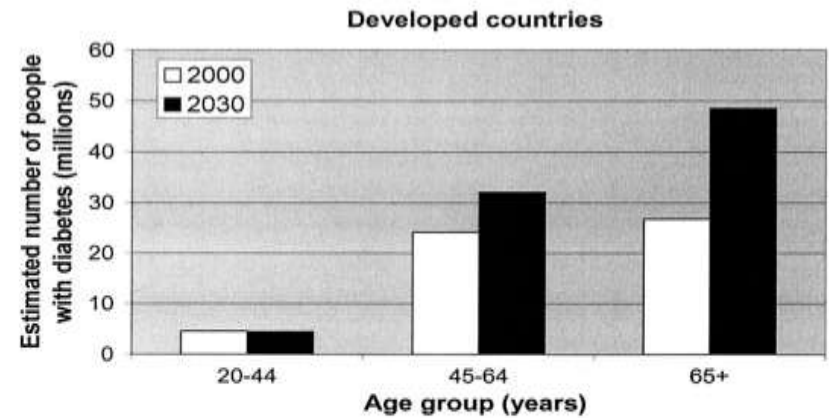
- Overview of Diabetes Mellitus
- Overview of Diabetic Retinopathy
- Diabetic Retinopathy Screening Program

# Diabetes Mellitus

- Diabetes mellitus is a major global public health problem.
- Diabetes Mellitus is an epidemic due to
  - Longer life-span
  - Modern lifestyle (urbanization)
  - Environmental and social factors:
    - Diet, obesity and physical activity

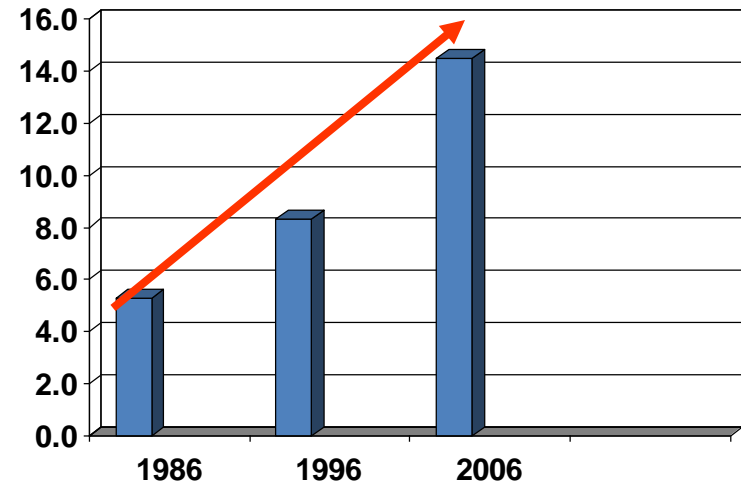
# Diabetes Mellitus

- Global Prevalence
  - 2000 - 2.8%  
(171 million Diabetics)
  - 2030 - 4.4 %  
(366 million Diabetics)
- The International Diabetes Federation predicts that the prevalence of DM in SEA will increase by 2 folds by year 2025



# Diabetes Mellitus

- Prevalence of DM among Malaysian adults – *National Health and Morbidity Study (NHMS)*
  - 1986 - 6.3% ( >35 yr)
  - 1996 - 8.3 % ( >30 yr)
  - 2006 -14.9% ( >30 yr)
  - Increased by 6% last decade
- Highest among Indians (19.9%) followed by Malay and Chinese
- WHO estimates that in year 2030, Malaysia would have 2.48 million people with DM



# Diabetes Mellitus

- 48% of the diabetics (age>40y.o) are not aware that they have diabetes (NHMS06)
- The complications associated with diabetes are debilitating
  - The commonest cause of visual loss among working adults in Malaysia
  - 15,000 to 39,000 people lose their sight because of diabetes (*NHMS 06*)
  - 14.6% of NIDDM aged 40 years and above, developed diabetic retinopathy after 5 years duration of diabetic condition

# Diabetes Mellitus

## Other complications (*NHMS-06*)

- **10%** - develop kidney disease
- **50%** - develop evidence of nerve damage after over 25 years of having diabetes.
- **2 to 4 times** more likely to have heart disease
- **5 times** likely to suffer a stroke.
- **27.7** times risk of leg amputation
- **one third of male** diabetics develop impotence due to diabetic neuropathy

# Diabetic Retinopathy (DR)

- All DM patients are at risk of developing DR
- According to Diabetic Eye Registry (MOH):
  - Diabetic retinopathy was 36.8% (2007)
  - Sight threatening DR was 15.6% (2007) and 11.5% (2008)



# Diabetic Retinopathy (DR)

- In early stage of DR – patient is asymptomatic
- Patients are unaware of their retinopathy changes
- Screening is necessary to identify the group at risk of visual loss

# Diabetic Retinopathy - Risk factors

- Duration of DM – the longer duration, higher risk
- Poor control of DM - HbA1c/FBS/2HPP
- Obesity / inactive lifestyle
- Other illnesses - HPT, CKD, CVA, CVD, hyperlipidemia, anaemia
- Smoking
- Pregnancy in diabetics
- Others:
  - Upper socioeconomic status
  - Urban residence
  - Male gender

# Diabetic Retinopathy – The Facts

- Good control of DM will delay the progression of DR
- Good control of co-morbid illnesses will reduce the severity of DR
- Pregnancy will cause progression of DR
- Healthy lifestyle is highly recommended

## **Diabetic Retinopathy - Screening and Challenges**

- DM is a growing problem with high numbers of diabetics each year
- Inadequate diabetic eye screening program
- Inadequate resources to complete the task
- Poor patient information / awareness

# Diabetic Retinopathy Screening

## How?

- Implementing a cost effective method in order to cater for this large number of population at risk without compromising the standard of care

# Diabetic Retinopathy Screening Tools



Direct ophthalmoscopy



Slit-lamp biomicroscopy with contact lens



Binocular indirect ophthalmoscopy



Fundus photography

# Diabetic Retinopathy Screening Program

- Non-mydriatic digital fundus camera in diabetic eye examinations is very useful
- Fundus images captured can be graded :
  - at site ( credentialed & privileged staff )
  - at selected centre via internet (Tele-DR)

# Diabetic Retinopathy Screening Program

## Where ?

1. primary health care centre :  
selected Klinik Kesihatan with  
fundus camera
2. Hospital/Clinics with eye care  
providers – ophthalmology  
and optometry clinics





# Diabetic Retinopathy Screening Program

Training of personnel:

- Family Medicine Specialist
- Medical Officers
- Optometrists
- Assistant Medical Officers / Staff nurses / JM

# Diabetic Retinopathy Screening Program



- Fundus photography workshop
- Reading / grading of photographs classes
- Credentialing/privileging of staff – grader of fundus photographs



# Diabetic Retinopathy Screening Program



# Diabetic Retinopathy Screening Program

## National Standard Program for Credentialing / Privileging of Screeners and Graders

- Screening protocol /Standard Operating Procedure (SOP)
- Training activities – fundus photography, grading of photos, referral criteria
- Good / acceptable referral system to Ophthalmologist
- Audit and Feedback mechanism

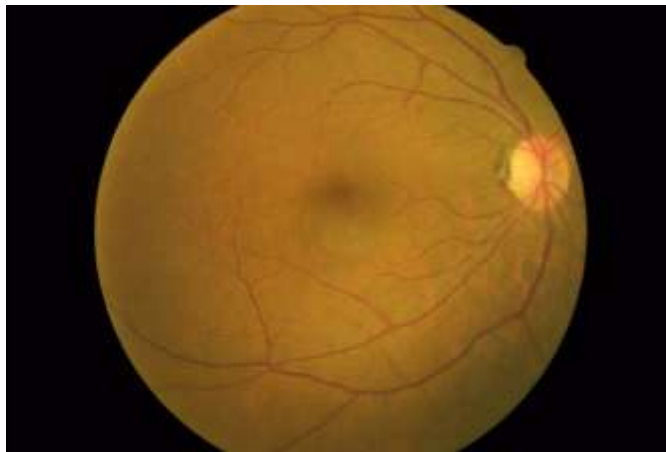
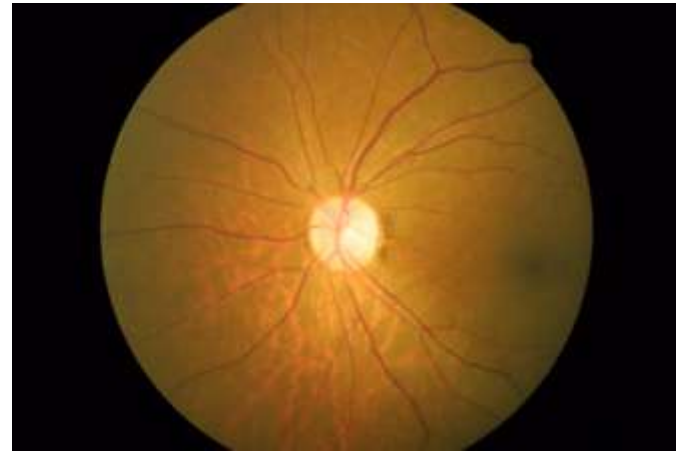
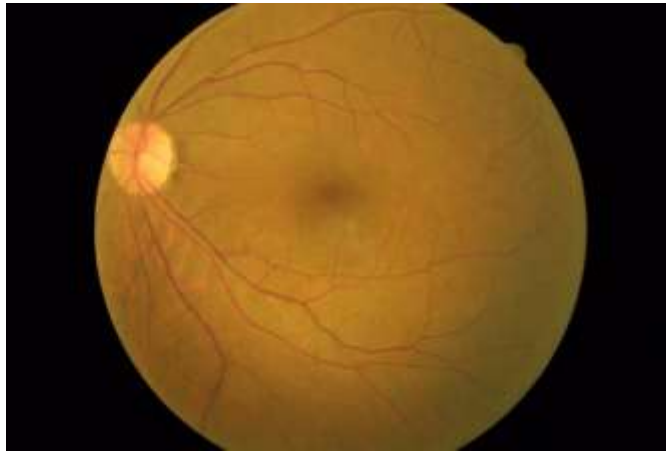
# Diabetic Retinopathy Screening Program

- Public health project
- 107 non-mydriatic fundus camera available in MOH Health Clinics (CPG 2011)
- Majority are MOH sponsored
- Fundus photo - taken by AMO/SN/JM
- Grading – Ophthalmologists / Optometrists / FMS / Trained graders

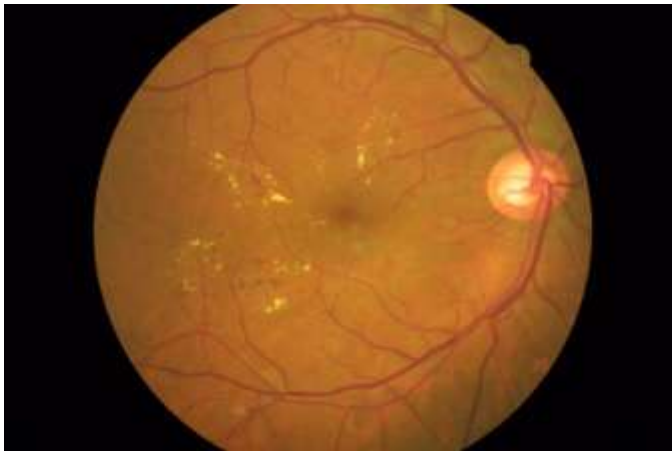
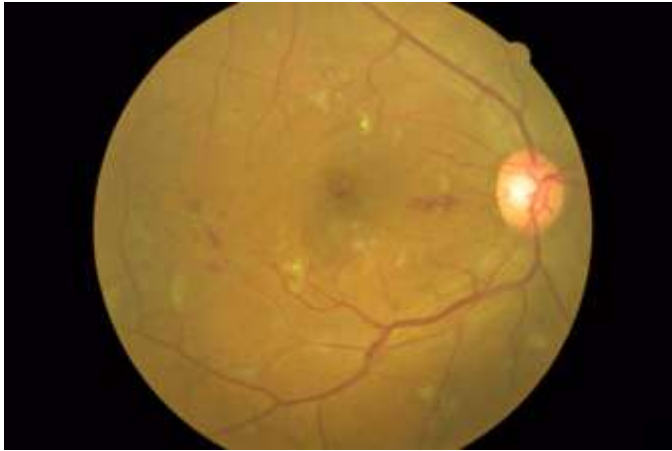
# Diabetic Retinopathy Screening Program

1. National screening program for prevention of blindness
2. Standard protocol for all states and hospitals
3. Cooperation from all stages of personnel
4. Echo training of staffs
5. Continuous supervision of graders and photographers
6. Credentialing and privileging committee

## Example of digital screening photos: Normal fundus

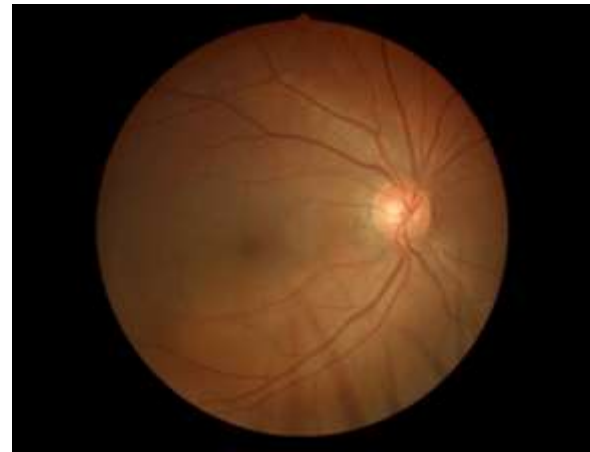
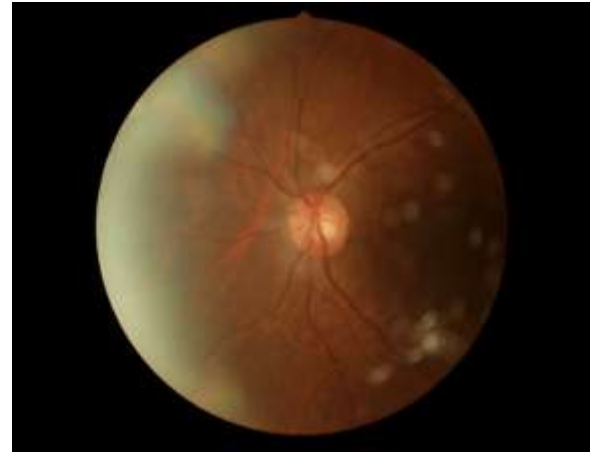


# Abnormal fundus





# Poor photos - unreadable



# Conclusion

- In Malaysia, diabetes mellitus is a growing concern
- Majority of patients with diabetes are unaware of their diabetic condition – mostly are asymptomatic in early stage and presented late with sight threatening DR
- Diabetic retinopathy is one of major complications of diabetes mellitus which causes blindness
- Screening for DR is essential for early detection and early treatment
- Implementing user / patient friendly and cost effective screening tools – non mydriatic fundus camera
- Commitment from all health care providers is important to ensure sustainability of program, thus preventing blindness among patients with diabetes

# Thank You