



# การบริหารจัดการความรู้เพื่อป้องกันตาบอดจากโรคเบาหวาน

รางวัลรองชนะเลิศรางวัลสหประชาชาติ ปี 2011 สาขาการบริหารจัดการความรู้ในภาครัฐ

โรงพยาบาลราชวิถี กรุงเทพมหานคร

# โครงการป้องกันตาบอดจาก โรคเบาหวาน

- เป็นโครงการเชิงรุก เพิ่มการเข้าถึงบริการของผู้ป่วยในเขตห่างไกล
- สร้างเจ้าหน้าที่ผู้คัดกรองเบาหวานเข้าตาในชุมชน มากกว่า 1000 คน
- ใช้เทคโนโลยี และระบบสารสนเทศ ในการรวบรวมความรู้ ถ่ายทอดความรู้ แก่เจ้าหน้าที่ และสร้างระบบส่งต่อผู้ป่วย

# การบริหารจัดการความรู้ที่เกี่ยวข้อง

- ทำวิจัย และประเมินเทคโนโลยีว่า กล้องถ่ายภาพจอตา ระบบดิจิทัล สามารถถูกนำมาใช้คัดกรองผู้ป่วยที่มีความเสี่ยงต่อตาบอด จากเบาหวานได้
- เผยแพร่ผลงานวิจัยในวารสารการแพทย์ต่างประเทศ และการประชุมวิชาการต่างประเทศ
- รวบรวมความรู้จากการวิจัย เพื่อนำมาใช้สร้างระบบ ในการป้องกันตาบอดจากเบาหวานโดยใช้ กล้องถ่ายภาพจอตา ระบบดิจิทัล

# การใช้กล้องถ่ายภาพจากระบบดิจิทัล ในชุมชน





**ผลงานวิจัยเกี่ยวกับ  
เบาหวานเข้าจอประสาทตา  
ที่ได้รับการเผยแพร่ระดับนานาชาติ**

# Our Published Papers

## **Screening for Diabetic Retinopathy in Rural Area Using Single-Field, Digital Fundus Images**

*Paisan Ruamviboonsuk, MD, Nattapon Wongcumchang, MD, Pattamaporn Surawongsin, MD,  
Ekchai Panyawatananukul, MD, Montip Tiensuwan, PhD*

## **Interobserver Agreement in the Interpretation of Single-Field Digital Fundus Images for Diabetic Retinopathy Screening**

*Paisan Ruamviboonsuk, MD, Khemawan Teerasuwanajak, MD, Montip Tiensuwan, PhD,  
Kanokwan Yuttitham, MD, Thai Screening for Diabetic Retinopathy Study Group*

## **The Prevalence of Diabetic Retinopathy in Trang Province Determined by Retinal Photography and Comprehensive Eye Examination**

*Supachai Supapluksakul MD, Paisan Ruamviboonsuk MD, Wansa Chaowakul MD*

## **A Model for Diabetic Retinopathy Screening in Communities in Thailand**

*Suravit Techathuvanan, MD, Paisan Ruamviboonsuk, MD*

# Interobserver Agreement in the Interpretation of Single-Field Digital Fundus Images for Diabetic Retinopathy Screening

Paisan Ruamviboonsuk, MD,<sup>1</sup> Khemawan Teerasuwanajak, MD,<sup>1</sup> Montip Tiensuwan, PhD,<sup>2</sup>  
Kanokwan Yuttitham, MD,<sup>1</sup> Thai Screening for Diabetic Retinopathy Study Group\*

**Purpose:** To assess agreement among a group of ophthalmic care providers, including ophthalmologists and trained nonphysician personnel, in the interpretation of single-field digital fundus images for diabetic retinopathy screening.

**Design:** Interobserver reliability study.

**Participants:** Twelve ophthalmic care personnel, including 3 retina specialists, 3 general ophthalmologists, 3 ophthalmic nurses, and 3 ophthalmic photographers.

**Methods:** All participants were to read 400 good single-field digital fundus images of diabetic patients from a community hospital. The nonphysician personnel group read the images 1 month after attending a 2-day intensive instruction course regarding diabetic retinopathy screening. The ophthalmologists read the images without additional training. The 3 retina specialists read the images again together 2 months later to form a consensus regarding retinopathy severity and macular edema for each case. All readers used the Early Treatment Diabetic Retinopathy Study standard photographs as guidelines.

**Main Outcome Measures:** The  $\kappa$  statistic was used for the reliability assessment of the diabetic retinopathy severity and macular edema, and for the identification of cases that needed referral to ophthalmologists.

**Results:** There is only fair agreement among all readers. The multirater  $\kappa$  coefficient for retinopathy severity is 0.34; for macular edema, 0.27; and for referral cases, 0.28. Retina specialists have the best agreement among all groups ( $\kappa = 0.58$  for retinopathy severity or macular edema,  $\kappa = 0.63$  for referrals). There is also fair agreement when all readers are compared with the consensus of retina specialists ( $\kappa_s = 0.35, 0.28,$  and  $0.29$  for retinopathy severity, macular edema, and referrals, respectively), and the retina specialist group also has the best agreement ( $\kappa_s = 0.63, 0.65,$  and  $0.67$  for retinopathy severity, macular edema, and referrals).

**Conclusions:** Without additional training, retina specialists may be the most reliable personnel to interpret single-field digital fundus images for diabetic retinopathy screening. For other ophthalmic care personnel to achieve comparable reliability, a comprehensive instruction course with specific continuing education is essential. Authorized nonphysician interpreters should be experts, and new standard photographs for single-field digital fundus image interpretation may also be required to improve interobserver reliability. *Ophthalmology* 2006;113:826–832 © 2006 by the American Academy of Ophthalmology.



# Invited International Symposiums

**20th Asia Pacific Academy of Ophthalmology**  
*Guala Lumpur, Malaysia, 27-31 March 2005*

**World Ophthalmology Congress 2008**  
*Hong Kong*

**Asia Pacific Academy of Ophthalmology and  
American Academy of Ophthalmology Joint Meeting**  
*Bali, Indonesia, May 16-19, 2009*

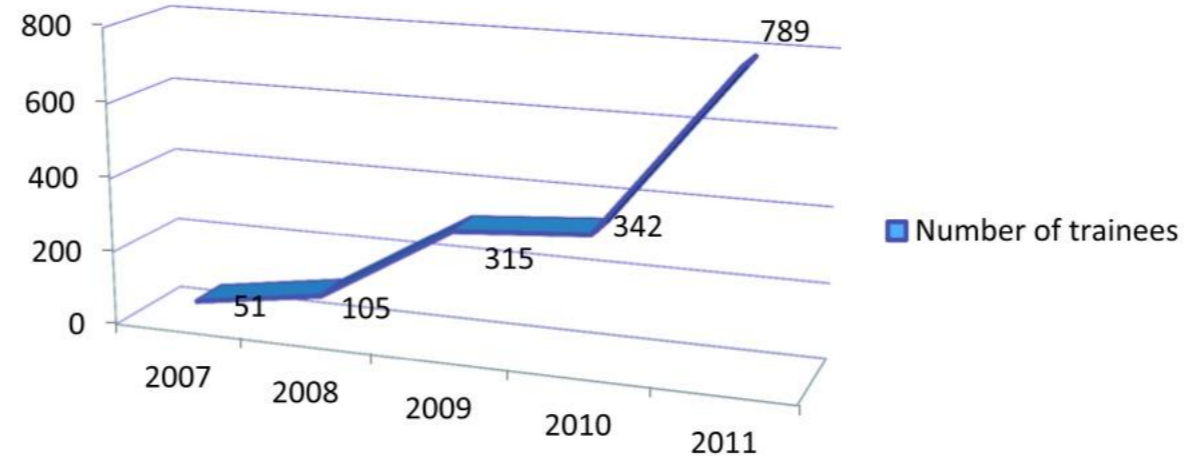
**2001 ASIA-ARVO Meeting on Research in Vision and Ophthalmology**  
*20-23 January 2011, Resorts World Sentosa, Singapore*

**แสดงจำนวนบุคคลากรผู้รับการ  
ถ่ายทอดระบบการคัดกรองเบาหวาน  
เข้าจอตา และการจัดอบรมใน 5 ปี**

**Continuing Monitoring of Trainees**

Since 2007, we have organized 23 courses in Bangkok, 13 courses in other provinces. We have trained 2,234 trainees from 55 provinces.

The number of training courses and trainees conducted in Bangkok and other provinces in the past 4 years.



At the end of January 2012, 209 trainees, other than those from the four pilot provinces, have logged in our website to assess their own qualification for continuing education in terms of sensitivity and specificity, we have found that 95 (45.5%) of them have both sensitivity and specificity more than 85% whereas 73 (34.93%) of them have sensitivity more than 90% and specificity more than 70%. We could identify trainees whose sensitivity and specificity was not up to the standard level to encourage them practice more or set up refresher courses for them.

Skills Transfer Courses for DR Screening Conducted in the Past 5 Years.

Year	Bangkok		Provincial Areas	
	Number of Classroom Courses	Number of Trainees	Number of Classroom Courses	Number of Trainees
2007	3	82	0	0
2008	8	307	0	0
2009	4	361	4	170
2010	2	245	3	247
2011	6	563	6	259
Total	23	1,558	13	676

# การใช้ เทคโนโลยีสารสนเทศ มาสนับสนุนโครงการ



# Preventing Diabetic Blindness

by Local Personnel for Local Patients



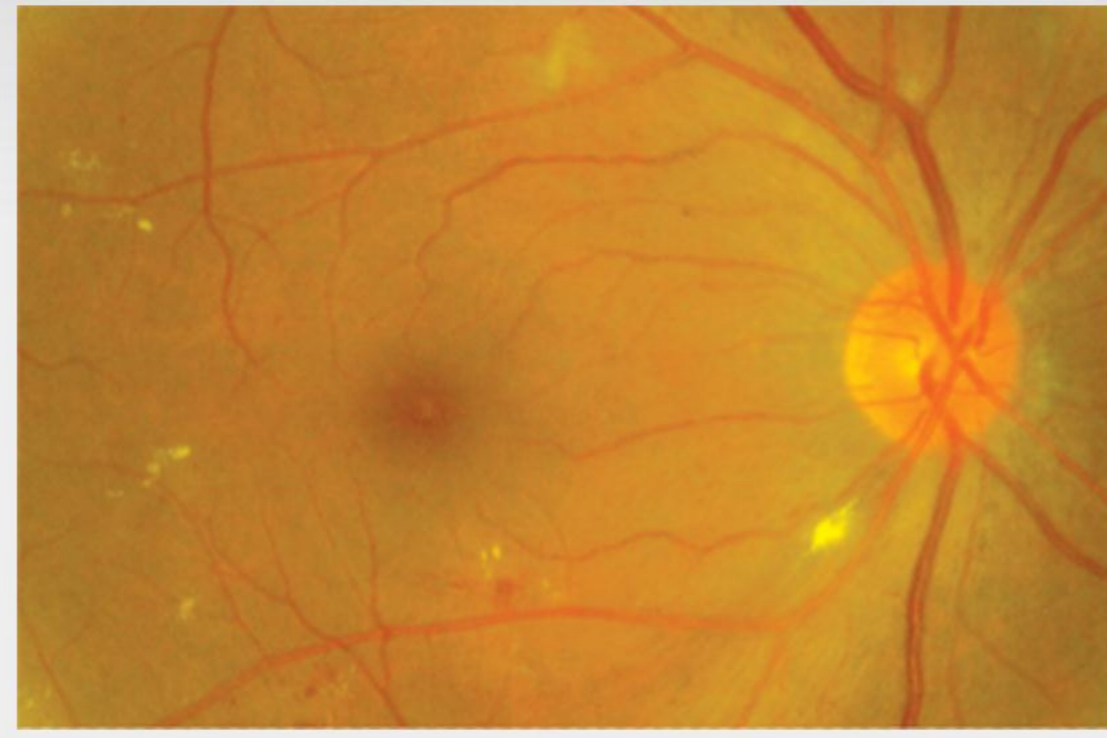
### UN Public Service Awards 2012



This project has been awarded the Second Place winner of the United Nations Public Service Awards 2012 in the category of Advancing Knowledge Management in Government

The followings are documents submitted to the United Nations for supporting of this project.

- Full Report on this initiative (PDF)
- How Our Web Works document (PDF)
- How Our Web Works magazine format (EXE)
- Diabetic Retinopathy: selected papers and presentations related



An image of diabetic retinopathy

Diabetic retinopathy (DR) is the most common ocular complication of diabetes. It is the leading cause of new blindness among adults aged 20 to 74 worldwide. Approximately 40-60% of patients with diabetes have DR. The World Health Organization estimated that DR was responsible for 4.8% of the 38 million blind people worldwide.

Read More ...

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# SELF-ASSESSMENT TEST

# Diagrams

E-learning  
Self-Assessment Test  
Practice

Consultation  
Referral  
Database

Resources  
Activities  
About Us

## HOW OUR WEB WORKS



**Question:**  
Refer a patient  
with this retinal image?

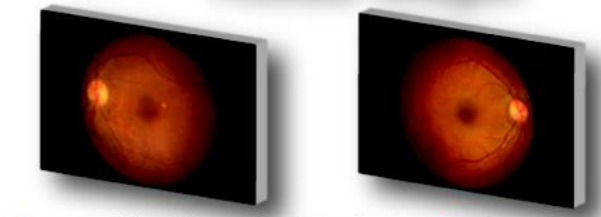
Yes No

**Random  
Display**

**Sensitivity  
Specificity  
Positive Predictive Value  
Negative Predictive Value  
Accuracy**

**Data Collection  
and Calculation**

**Pooled Images**



**Web Serever**

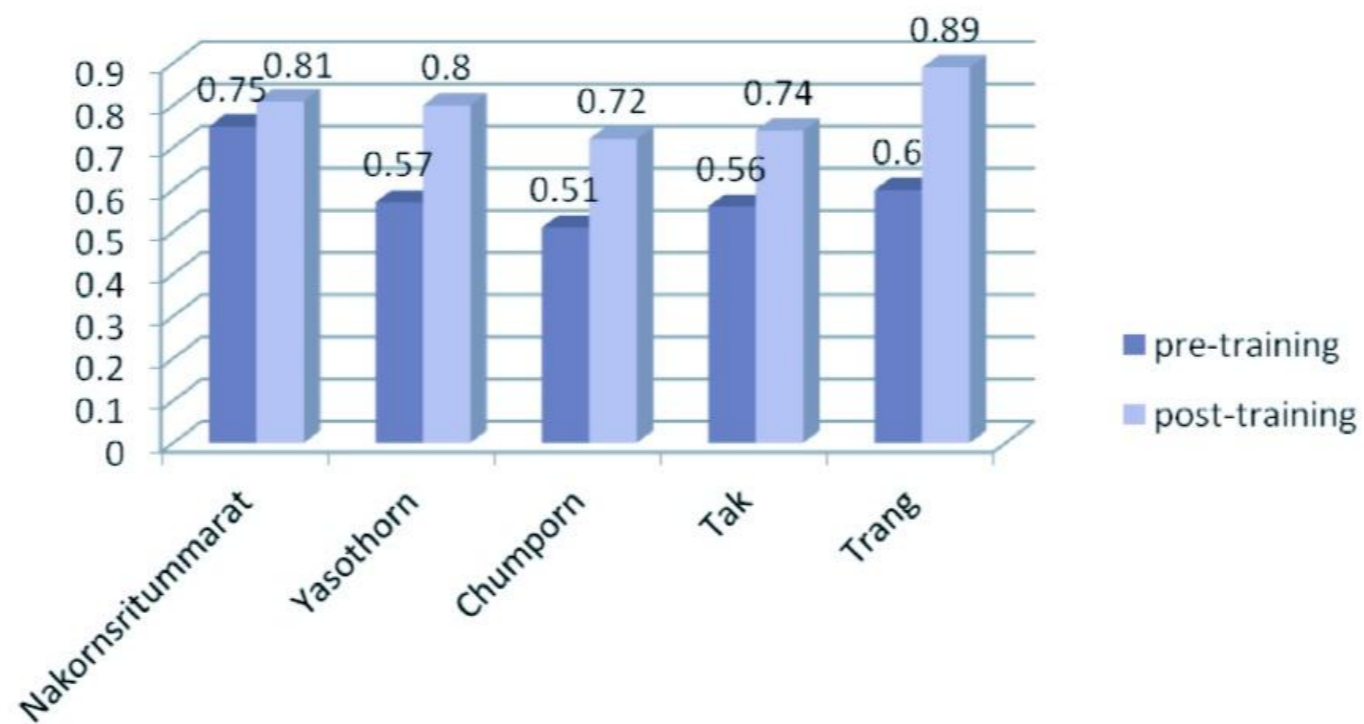
**This** menu is for assessing qualification of trainees.  
The test contains 50 color retinal images. They are randomly selected from a pool of retinal images from referrals and non-referrals. The trainees are required to interpret the images one by one and make a decision whether or not to refer the patient with the image. The trainees can view the images in full size and zoom in or out for finding pathological lesions. Their qualification is shown as sensitivity, specificity, positive predictive value, negative predictive value, and accuracy. All of these parameters are reported during the test. The standard qualification level is set at 85 percent of sensitivity (correctly identify referrals) and specificity (correctly identify non-referrals)

**การควบคุมคุณภาพของบุคลากร  
ผู้คัดกรองใบหาหวานเข้าจอตา  
ในชุมชน**

Specificity at Different Levels of the Trainees in Each Province.

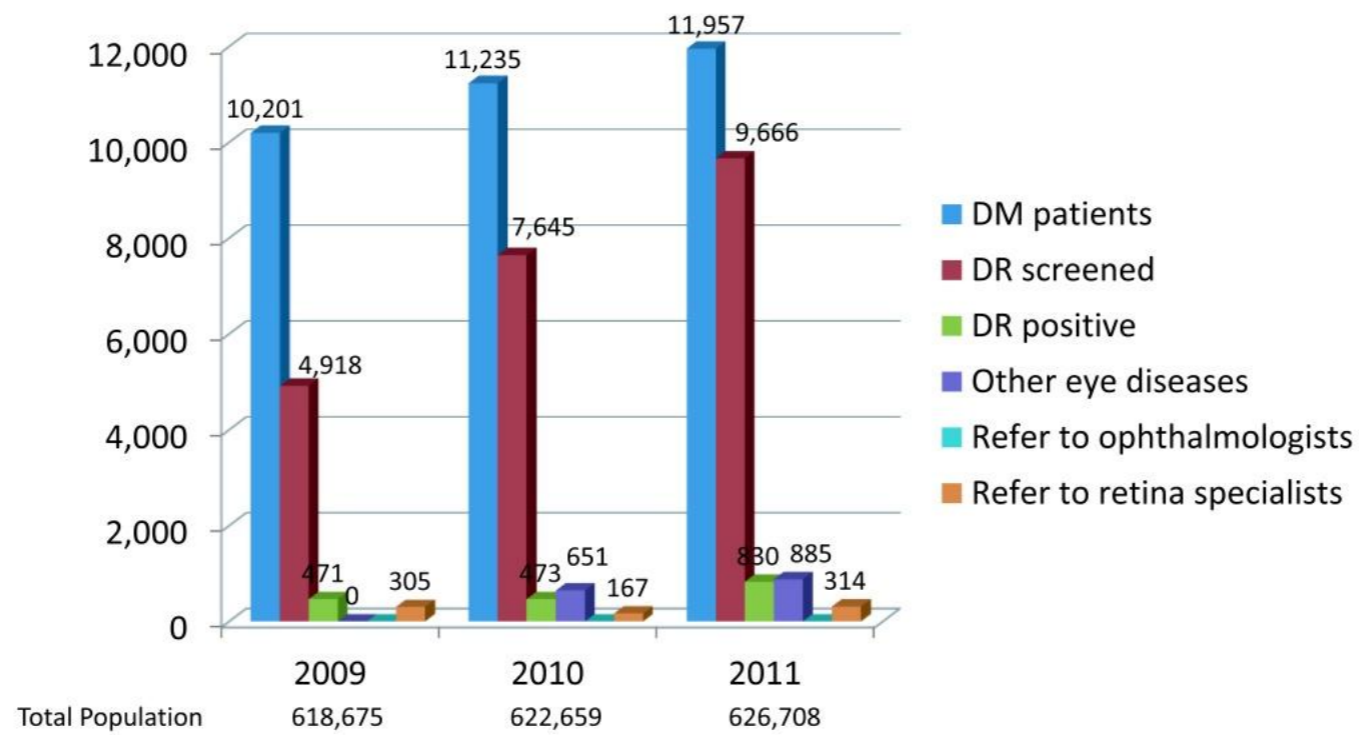
	Nakorn sritummarat		Yasothon		Chumporn		Tak		Trang	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Number	56	45	123	104	110	105	91	86	70	46
Specificity >95	9 (16.1%)	5 (11.1%)	10 (81.3%)	11 (10.6%)	2 (1.8%)	5 (4.8%)	6 (6.6%)	4 (4.6%)	8 (11.4%)	15 (32.6%)
>90	9 (16.1%)	16 (35.6%)	14 (11.4%)	23 (22.1%)	3 (2.7%)	13 (12.3%)	6 (6.6%)	8 (9.3%)	9 (12.9%)	24 (52.2%)
>85	9 (16.1%)	23 (51.1%)	27 (21.9%)	44 (42.3%)	9 (8.1%)	30 (28.6%)	9 (9.9%)	22 (25.6%)	15 (21.4%)	40 (87.0%)
>80	9 (16.1%)	28 (62.2%)	29 (23.6%)	57 (54.8%)	12 (10.9%)	40 (38.1%)	14 (15.4%)	33 (38.4%)	17 (24.3%)	42 (91.3%)

Average Specificity of the Trainees in Each Province.

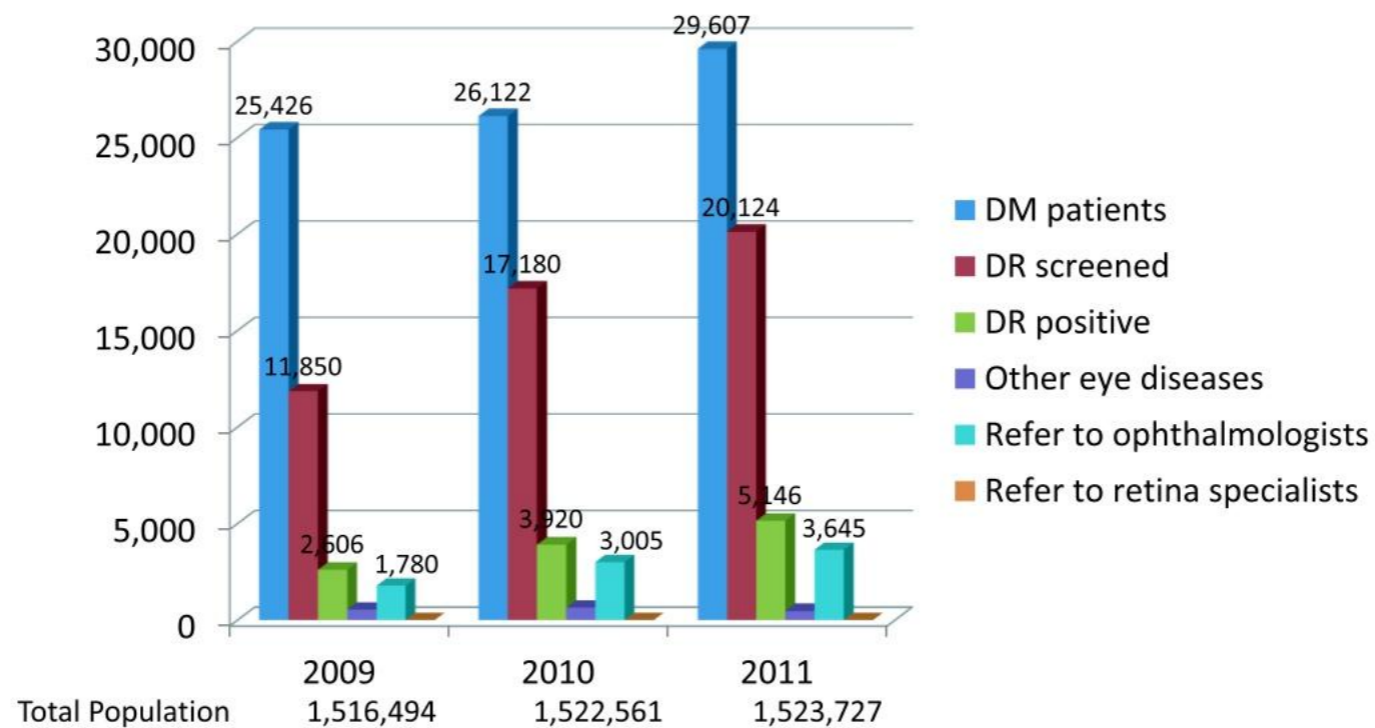




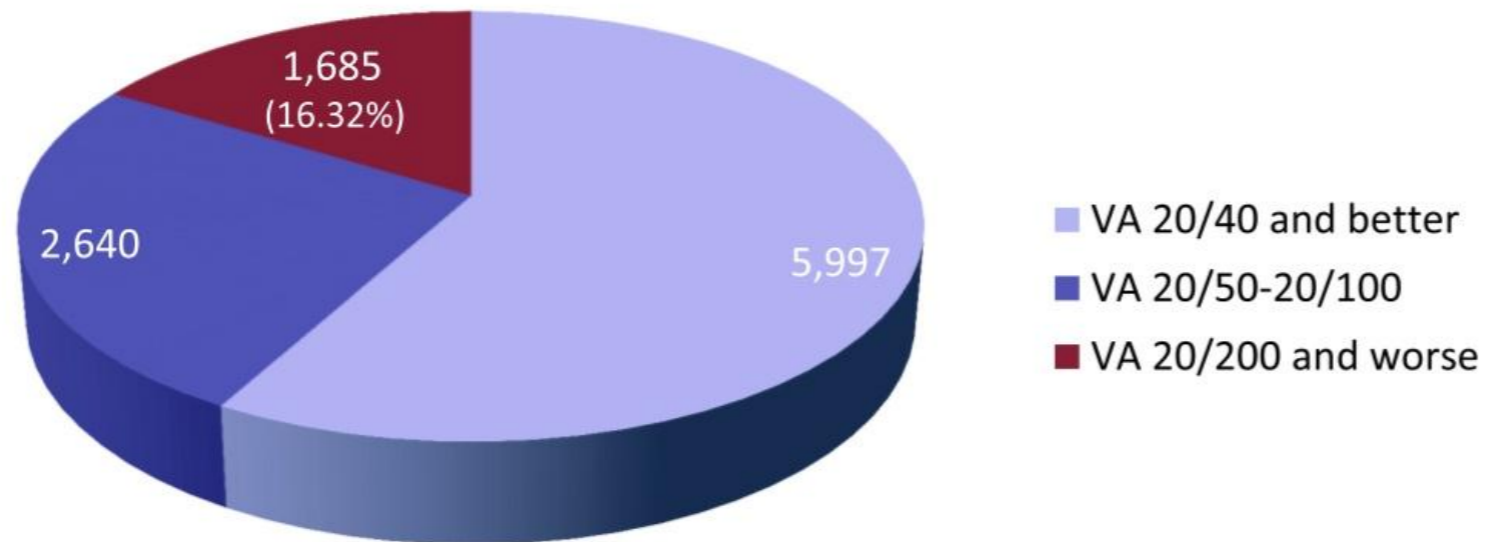
The number of patients with diabetes screened for DR and referred in Trang province in 2009, 2010, and 2011.



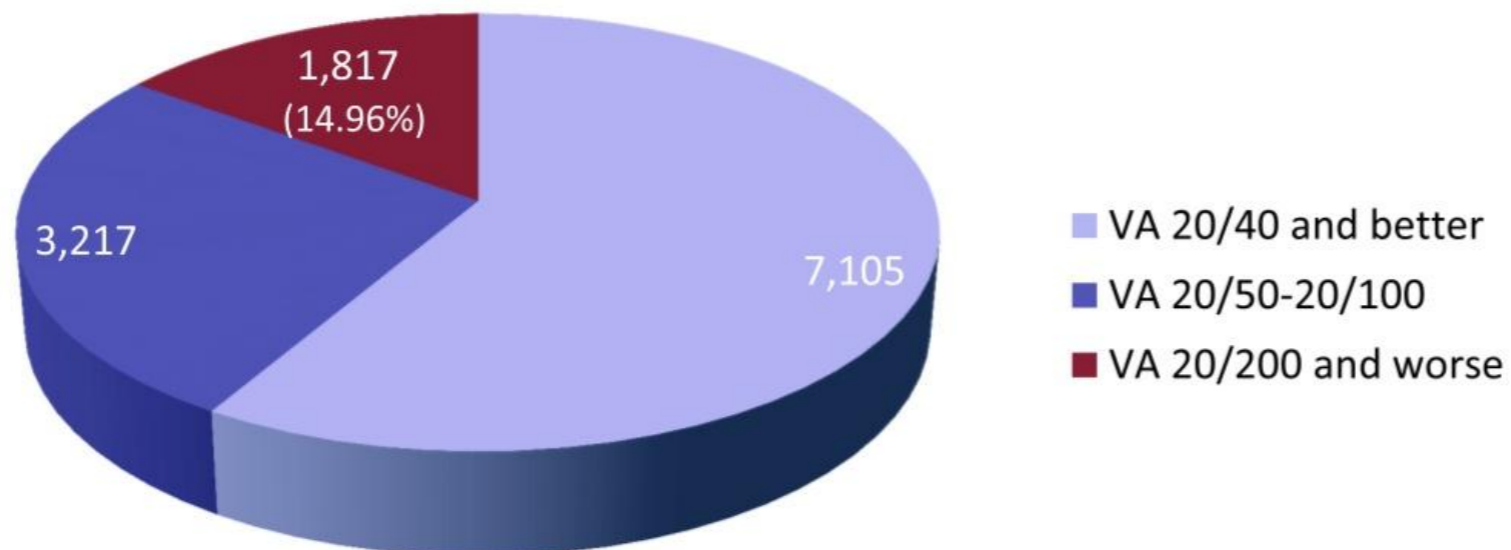
The number of patients with diabetes screened for DR and referred in Nakornsrihammarat province in 2009, 2010, and 2011.



Visual Results of Patients from Yasothorn Province in the Year 2010.



Visual Results of Patients from Yasothorn Province in the Year 2011.







BETTER MANAGEMENT — BETTER PUBLIC SERVICE



*23 June 2012*

*United Nations Public Service Award 2<sup>nd</sup> Place Winner*

**Advancing Knowledge Management in Government Category**

*This certificate is given in recognition of the contribution of*

**Rajavithi Hospital  
Thailand**

*towards improving the effectiveness, efficiency and quality of public service.*

Sha Zukang

Under-Secretary-General for Economic and Social Affairs