# Prevalence of CKD and Causes of ESRD in Asia

**Chih-Wei Yang**

Taiwan

Representing

AfCKDi Work Group 3

# CKD and ESRD in Asia

## A Major Co-morbidity


From USRDS

- 3.6 billion people, 60% of the world's population.
- **Aging societies**: Life expectancy in Asia has been increasing but birth rate decreasing in Japan, China, South Korea, and Taiwan.
- **Change in lifestyle** similar to western countries has changed disease epidemiology.
- **Chronic diseases**, such as diabetes, hypertension, and metabolic syndrome, have become common

*Enyu Imai, Seiichi Matsuo*
**The Lancet, Vol 371, 2008**

# Chronic Kidney Disease in Asia

- Glomerulonephritis was the most common chronic kidney disease in Asia.
- Glomerulonephritis: the leading cause of ESRD in China (47.3%) and the second leading cause in Japan (25.6%) in 2004.
- Hematuria: 3.5% of the population in China and 9.0% of that in Okinawa, Japan.
- Proteinuria: 4.1% of the population in Japan, 7.9% in Taiwan, and 0.5% in China.

*Enyu Imai, Seiichi Matsuo*
**The Lancet, Vol 371, 2008**

# Background

- CKD is a major health burden in Asia with high heterogeneity in epidemiology and in socioeconomic status.
- A consensus was made in the AfCKDi workgroup to gathering current causes of ESRD and prevalence of CKD from the Asian countries or regions.
- These data were mainly from registries or from local hospital data if registry is not available in that country.
- These data served as a basis for future population target of CKD prevention/treatment and for the foundation of Asian Best Practice Guidelines initiatives.

# AfCKDi
# Work Group 3

*Chair*

Philip K.T. LI, Hong Kong

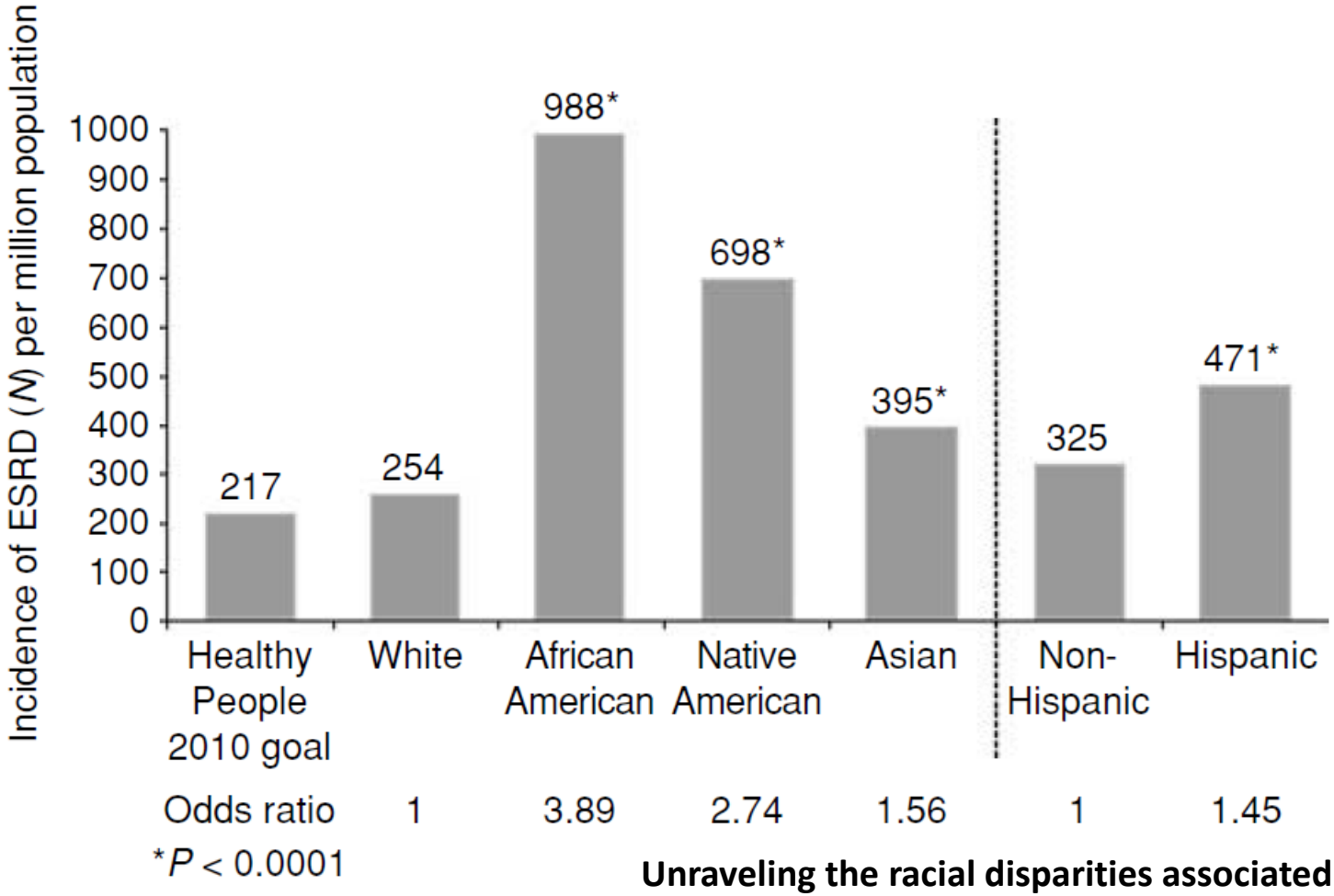
- Togtokh ARIUNAA, Mongolia
- Jimmy Teo BOON, Singapore
- Nan CHEN, China
- Anutra CHITTINANDANA, Thailand
- Kai Ming CHOW, Hong Kong-Secretary
- Lynn GOMEZ, Philippines
- David HARRIS, Australia
- Lai Seong HOOI, Malaysia
- Vivek JHA, India
- Suhnggwon KIM, Korea
- Sanjib KUMAR, Nepal
- Seiichi MATSUO, Japan
- Enyu Imai, Japan
- Rowan WALKER, Australia
- Haiyan WANG, China
- Chih Wei YANG, Taiwan
- Seong Lai Hooi, Malaysia

# Outline

- Status of ESRD and CKD in Asia
- ESRD registry data from Asia – AfCKDi WG3
- Diabetes as a primary cause of CKD and ESRD
- Publications related to CKD in Asia
- Future direction

# Incidence of ESRD in the United States in 2001, By Race and Ethnicity Adjusted for Age and Gender

Data from the United States Renal Data System 2003

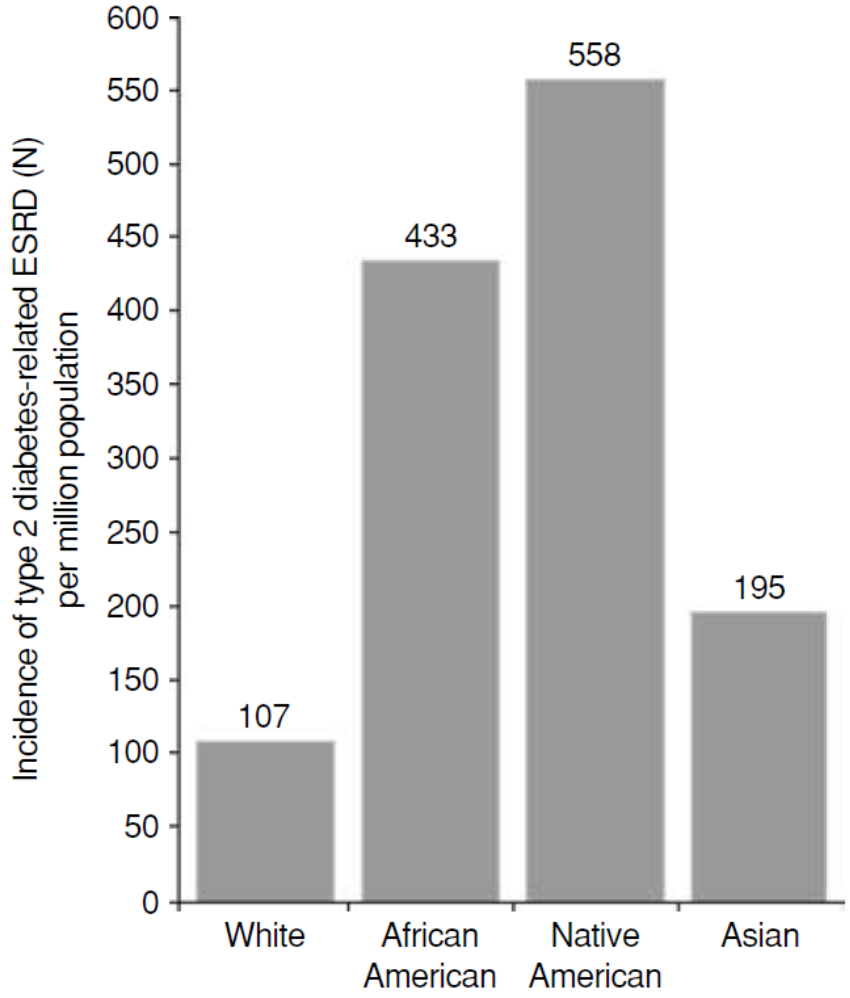



**Unraveling the racial disparities associated with kidney disease.**

Norris KC, Agodoa LY. Kidney Int. 2005 Sep;68(3):914-24.

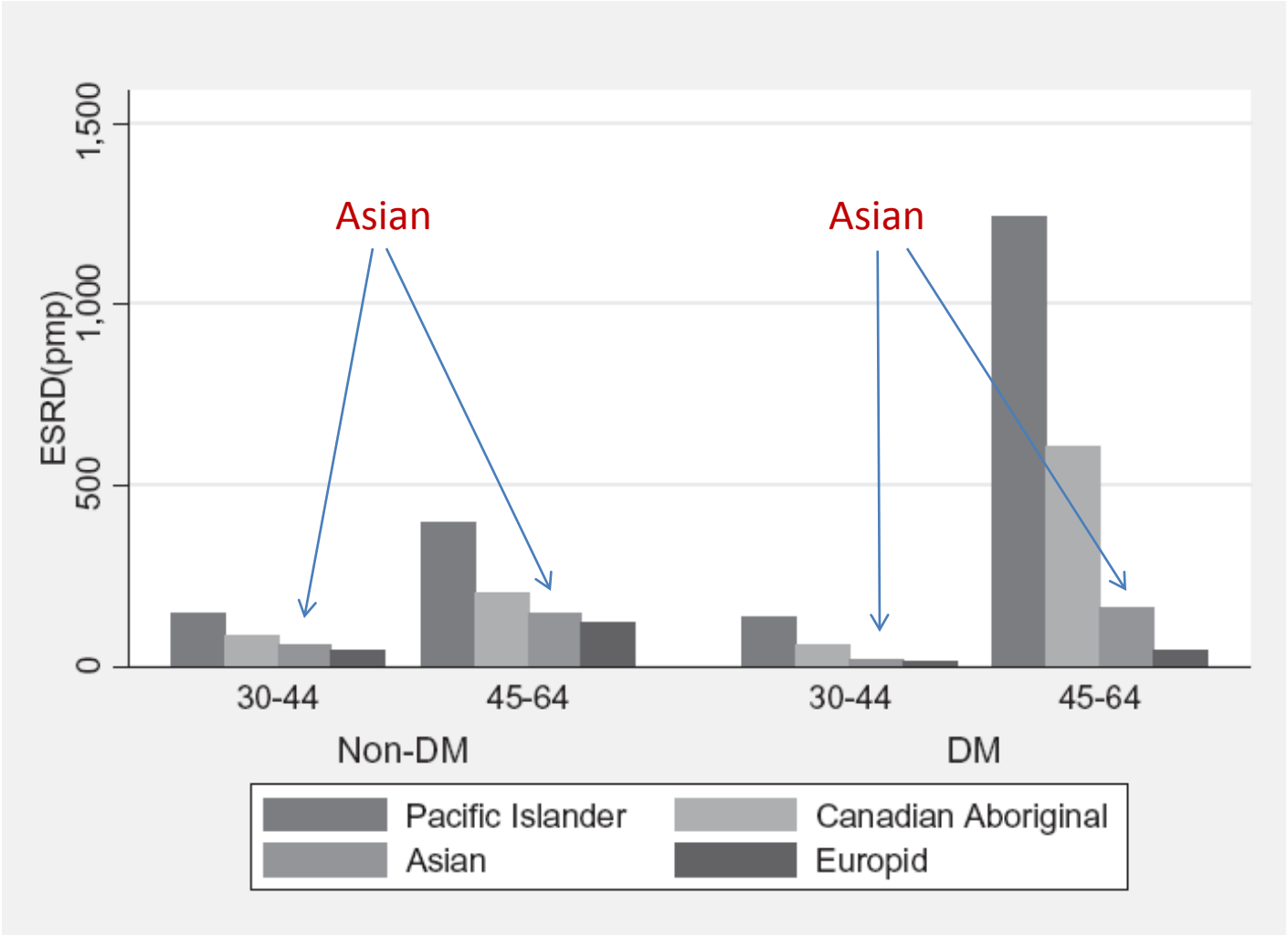
# The incidence of reported type 2 diabetes-related ESRD in the United States by race

**combined data for 1998–*2001 Rates adjusted for gender***
***Data from the USRDS*** 2003.



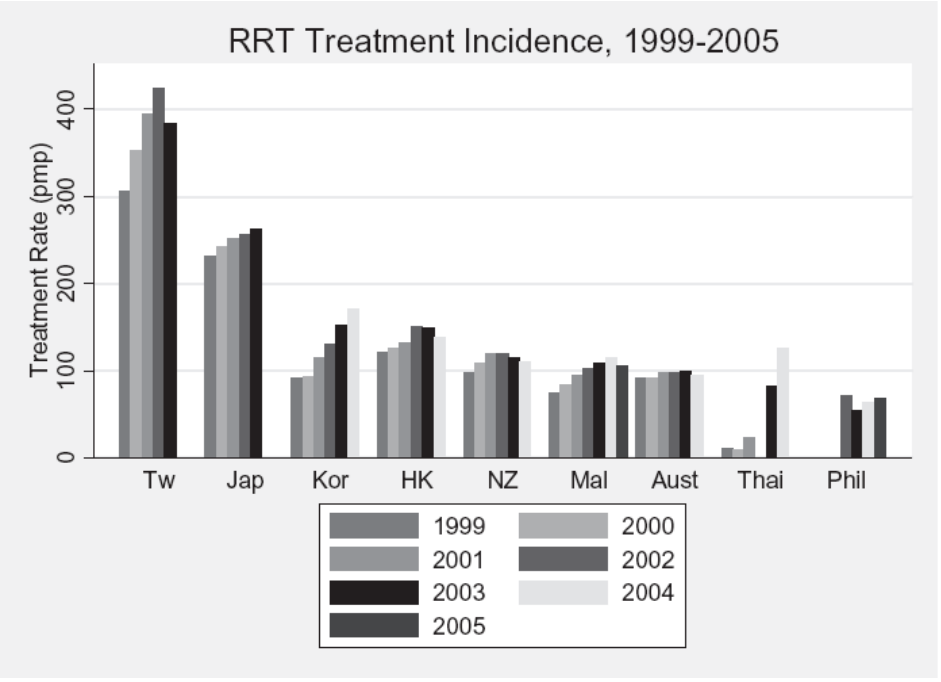

Kidney Int. 2005 Sep;68(3):914-24.
**Unraveling the racial disparities associated with kidney disease.**
Norris KC, Agodoa LY.

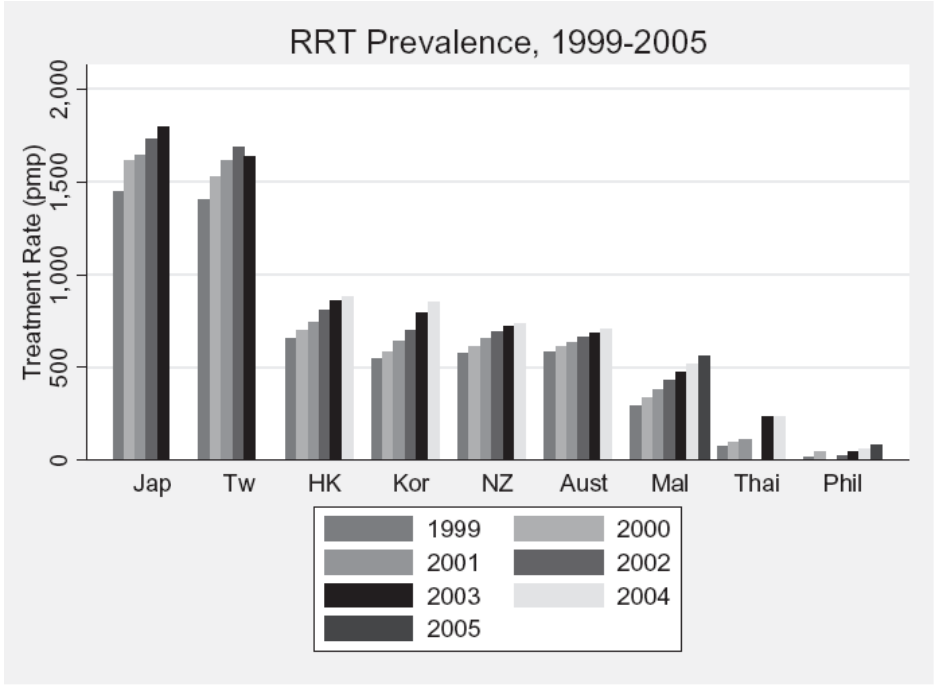
# Age- and sex-standardized incidence rates for all diabetic and all non-diabetic ESRD among various ethnic groups



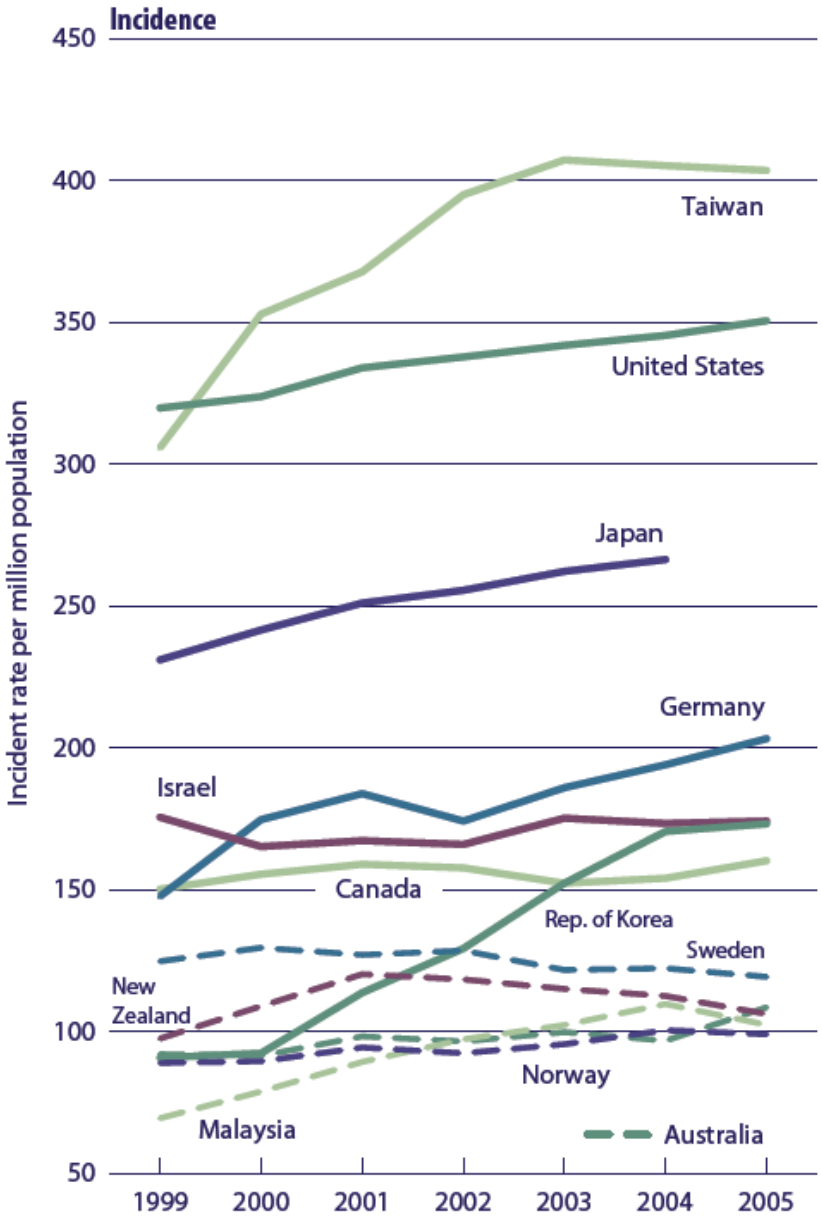

TECK-ONN LIM **NEPHROLOGY 2008; 13, 745–752**

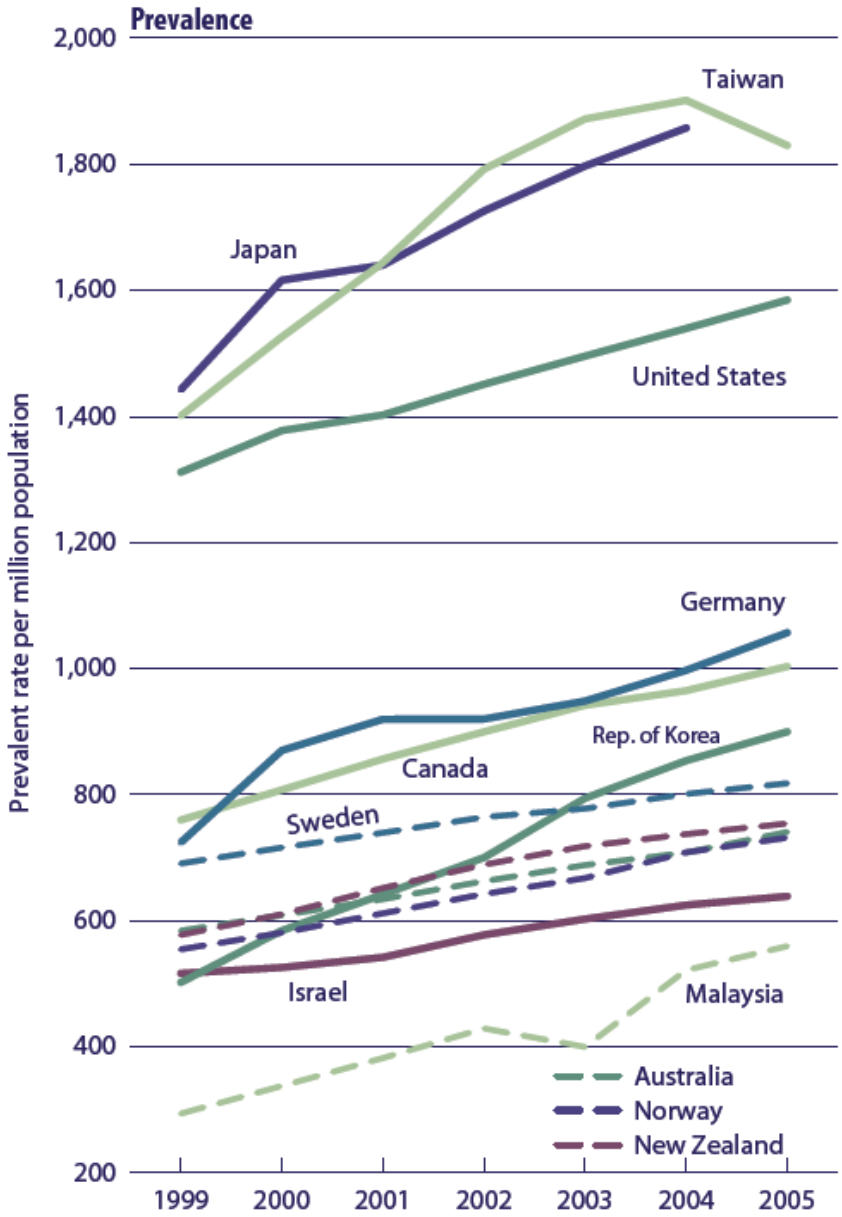
# Incidence and prevalence of renal replacement therapy (RRT) among various countries in the Asia-Pacific region



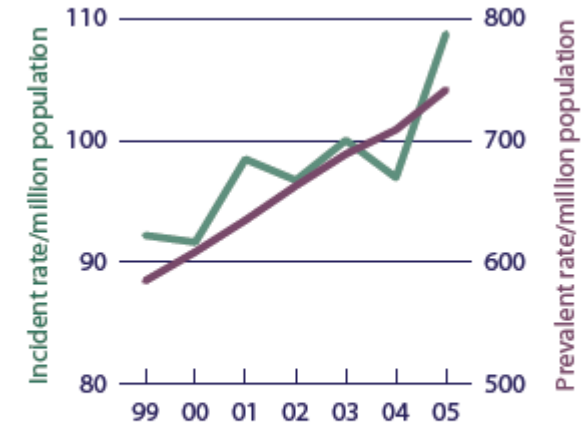




TECK-ONN LIM **NEPHROLOGY 2008; 13, 745–752**

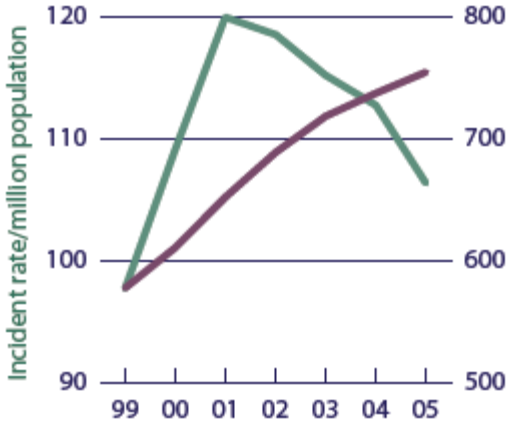

Incidence
Incident rate per million population
450
400
350
300
250
200
150
100
50
1999
2000
2001
2002
2003
2004
2005
Taiwan
United States
Japan
Germany
Israel
Canada
Rep. of Korea
Sweden
New Zealand
Norway
Malaysia
Australia


Prevalence
Prevalent rate per million population
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
1999
2000
2001
2002
2003
2004
2005
Taiwan
Japan
United States
Germany
Rep. of Korea
Canada
Sweden
Israel
Malaysia
Australia
Norway
New Zealand

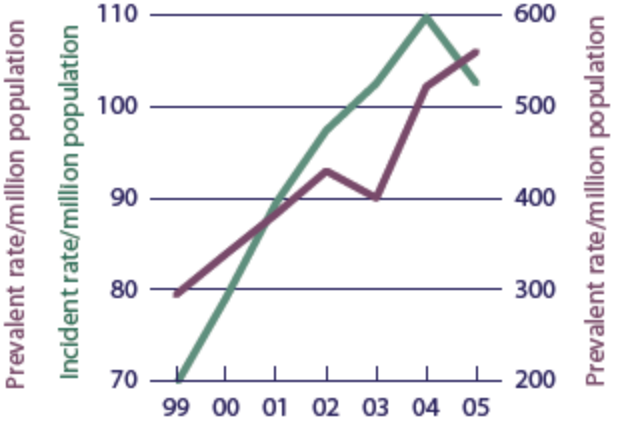
USRDS



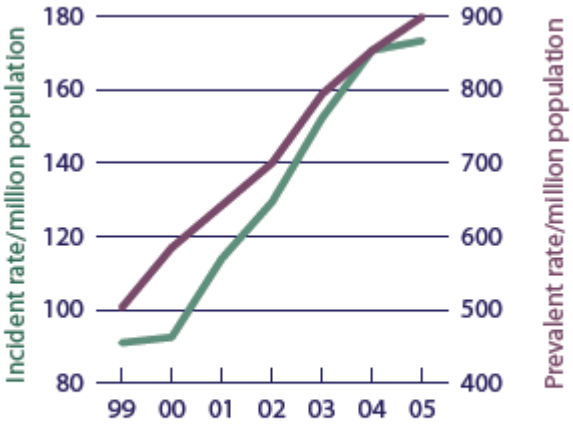

**Trends in incident & prevalent rates: Australia**



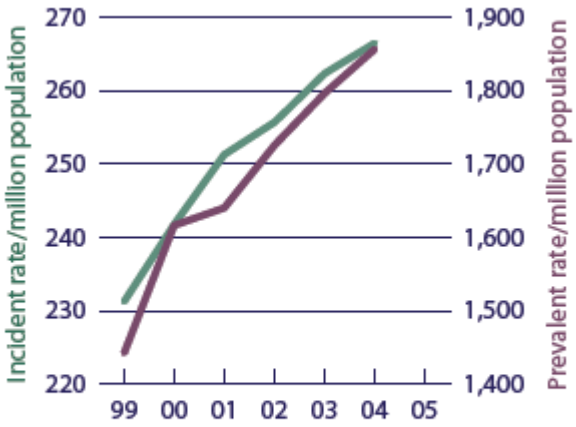

**Trends in incident & prevalent rates: New Zealand**




**Trends in incident & prevalent rates: Malaysia**




**Trends in incident & prevalent rates: Republic of Korea**



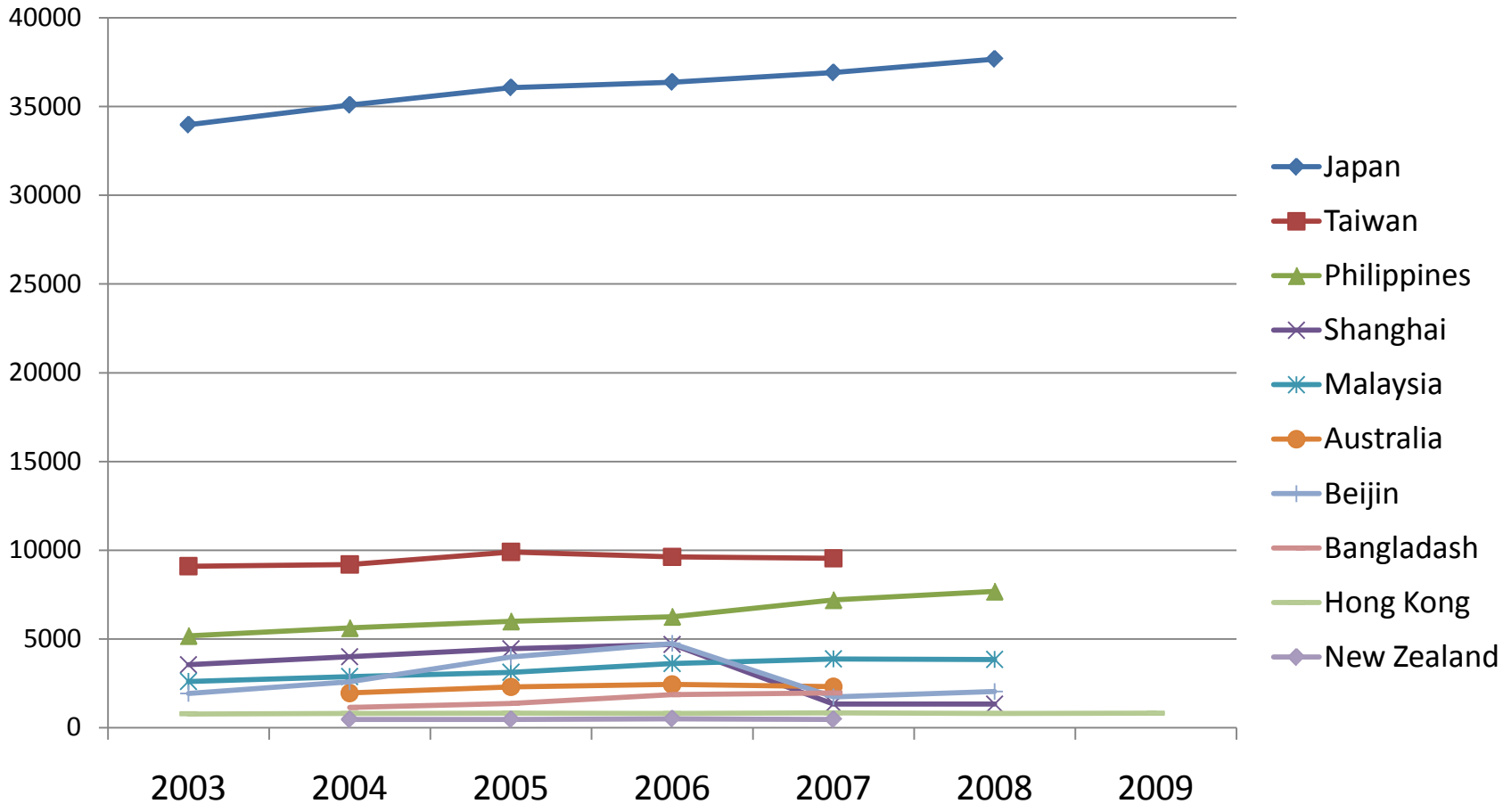

**Trends in incident & prevalent rates: Japan**


**Trends in incident & prevalent rates: Taiwan**

# Incidence and Prevalence of ESRD within Asia

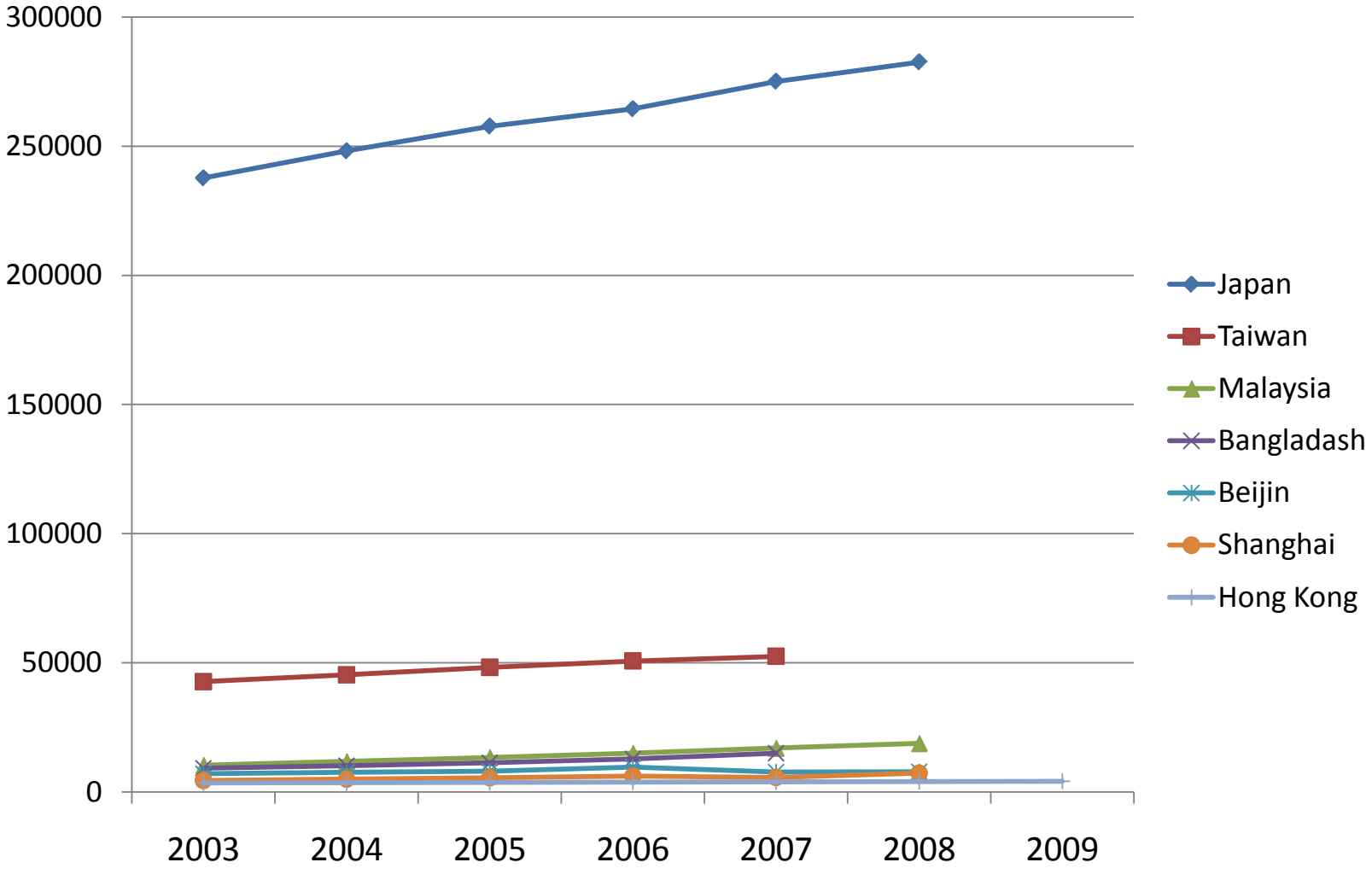
USRDS International Comparison

# Incidence Cases of ESRD in Asia



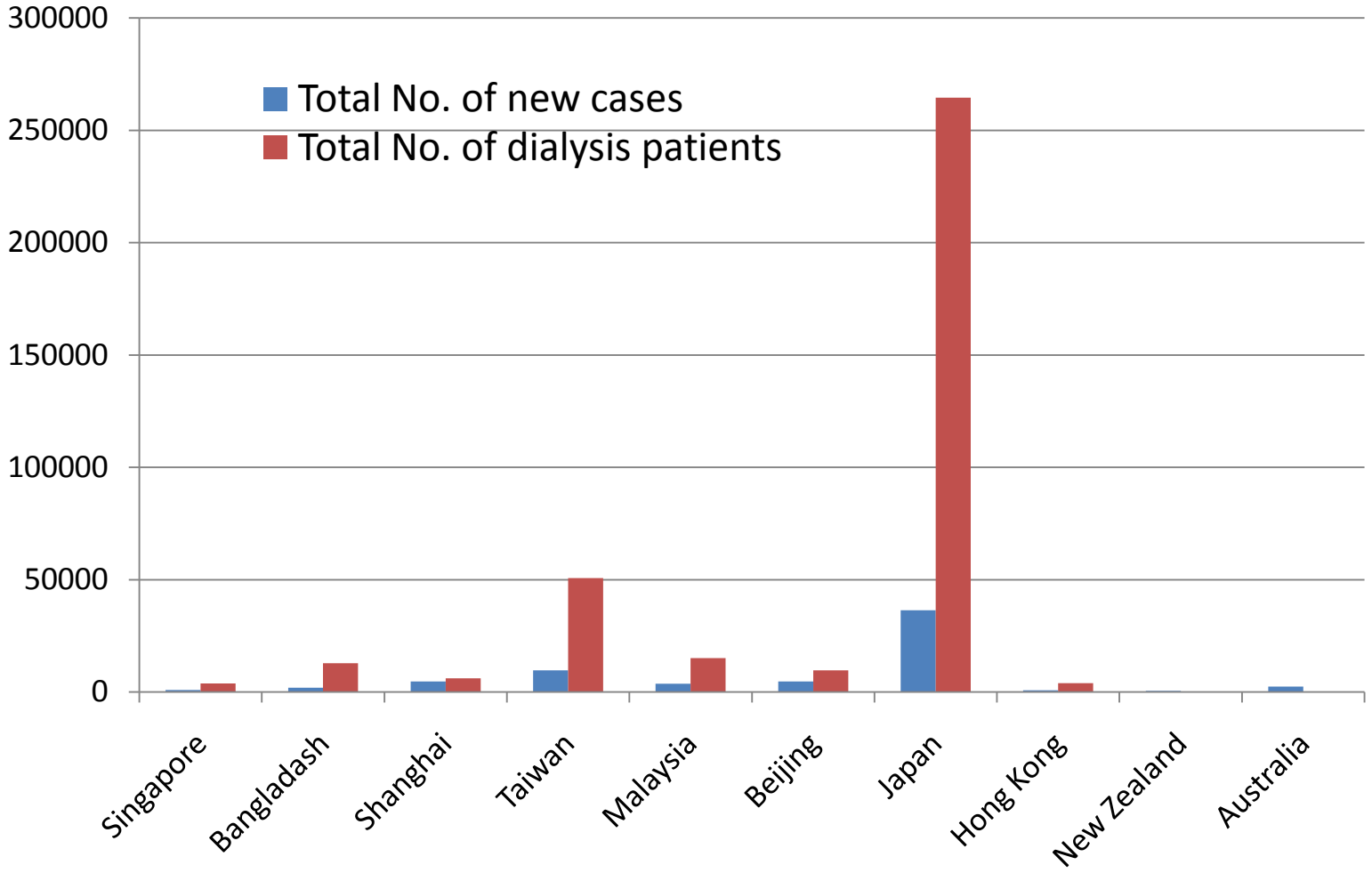

AfCKDi WG3

# Prevalent Cases of ESRD in Asia




AfCKDi WG3

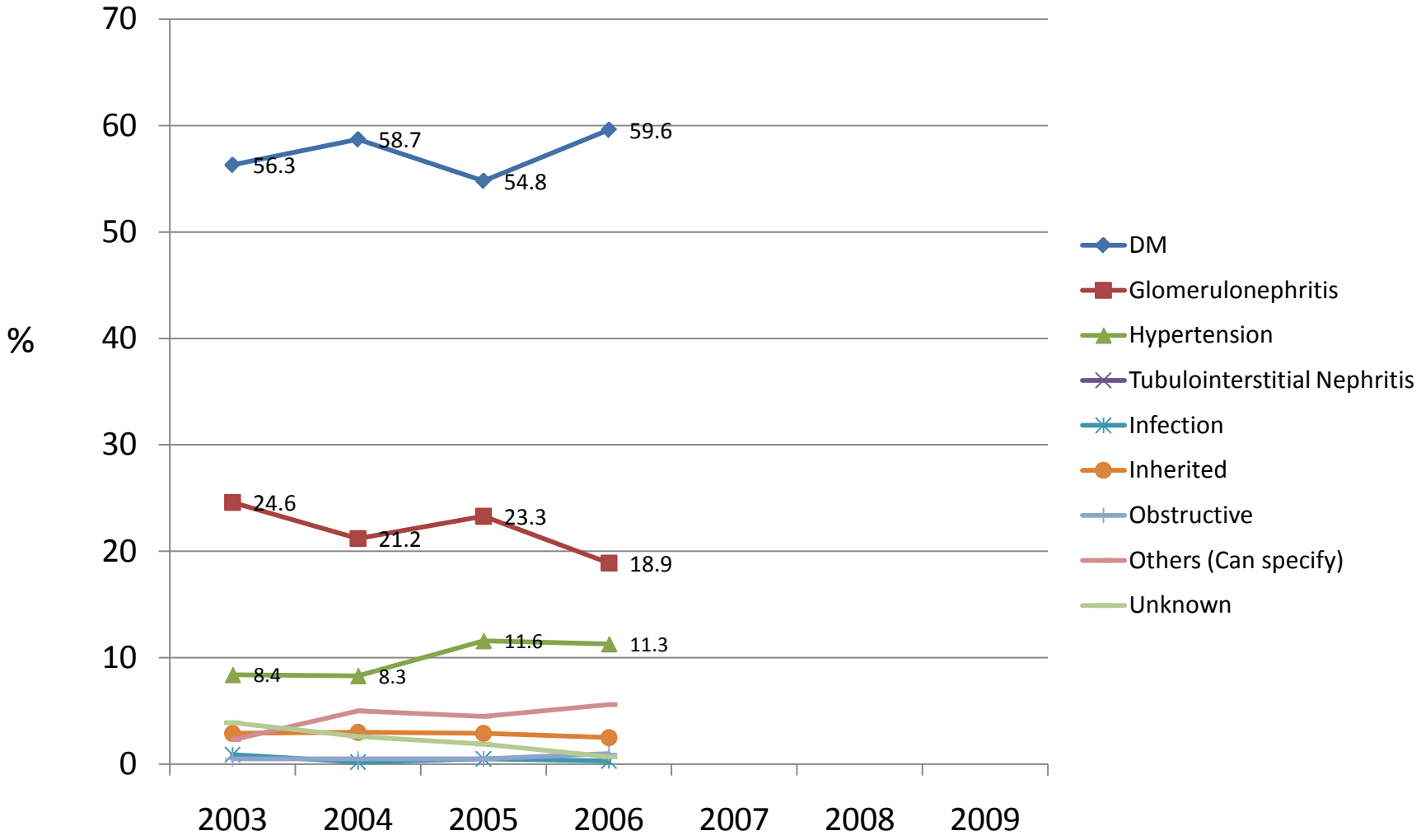
# ESRD Burden in Asia 2006




AfCKDi WG3

# Singapore

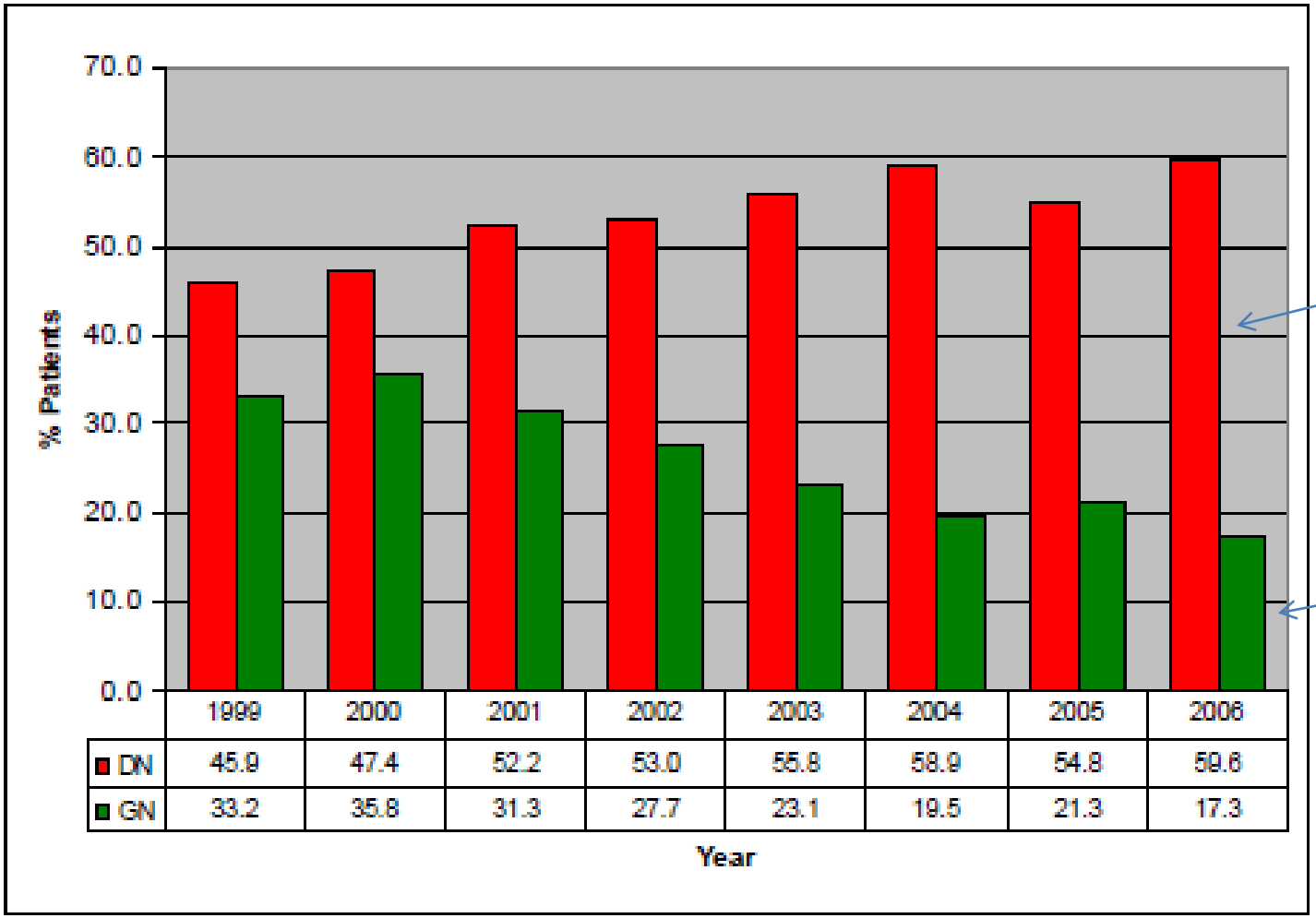
## Incidence Causes of ESRD




AfCKDi WG3

# Singapore

Incidence Trend of Diabetic nephropathy and Glomerulonephritis as a cause of ESRD

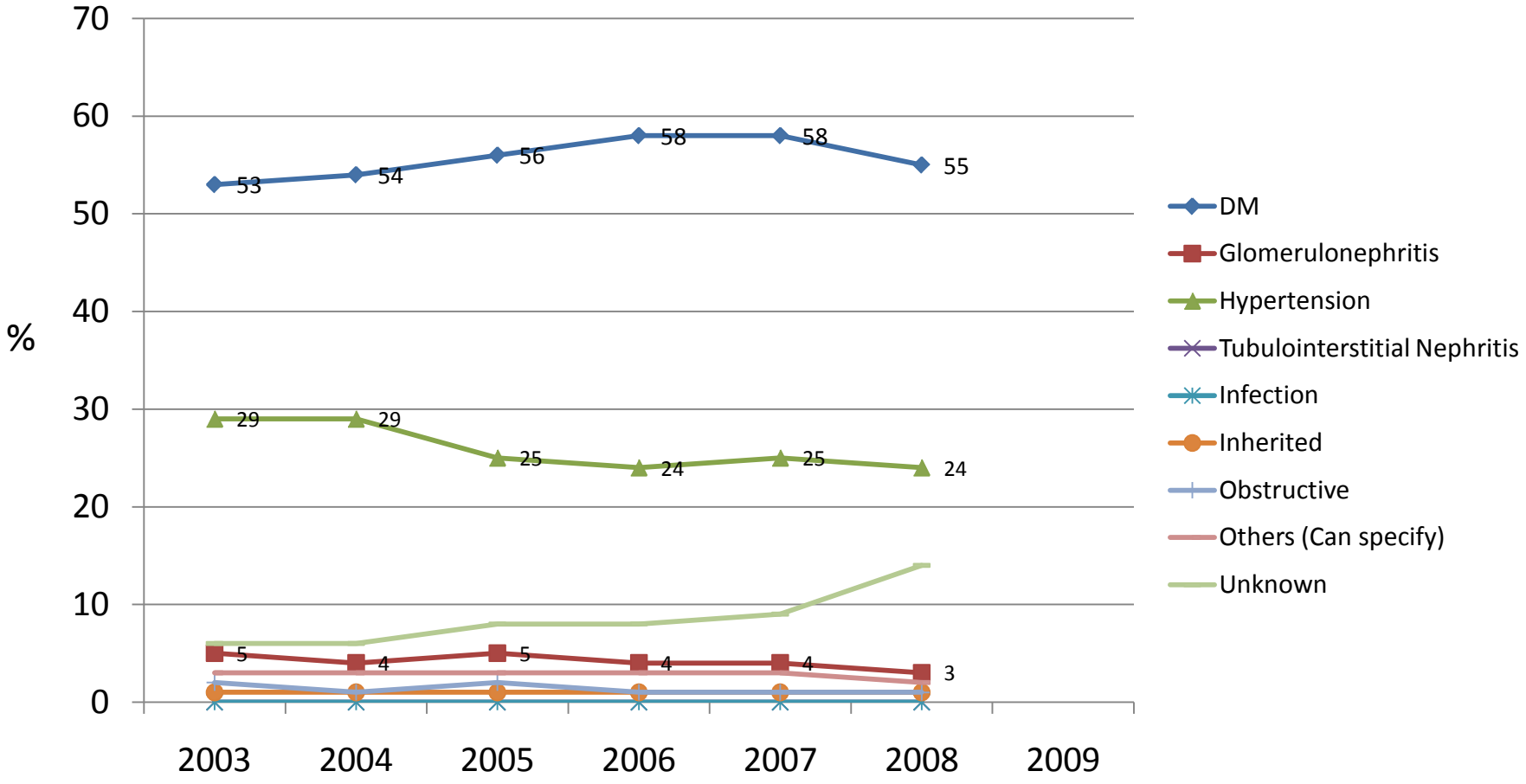



| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|
| DN | 45.9 | 47.4 | 52.2 | 53.0 | 55.8 | 58.9 | 54.8 | 59.6 |
| GN | 33.2 | 35.8 | 31.3 | 27.7 | 23.1 | 19.5 | 21.3 | 17.3 |

Singapore Renal Registry 2005/2006

# Malaysia

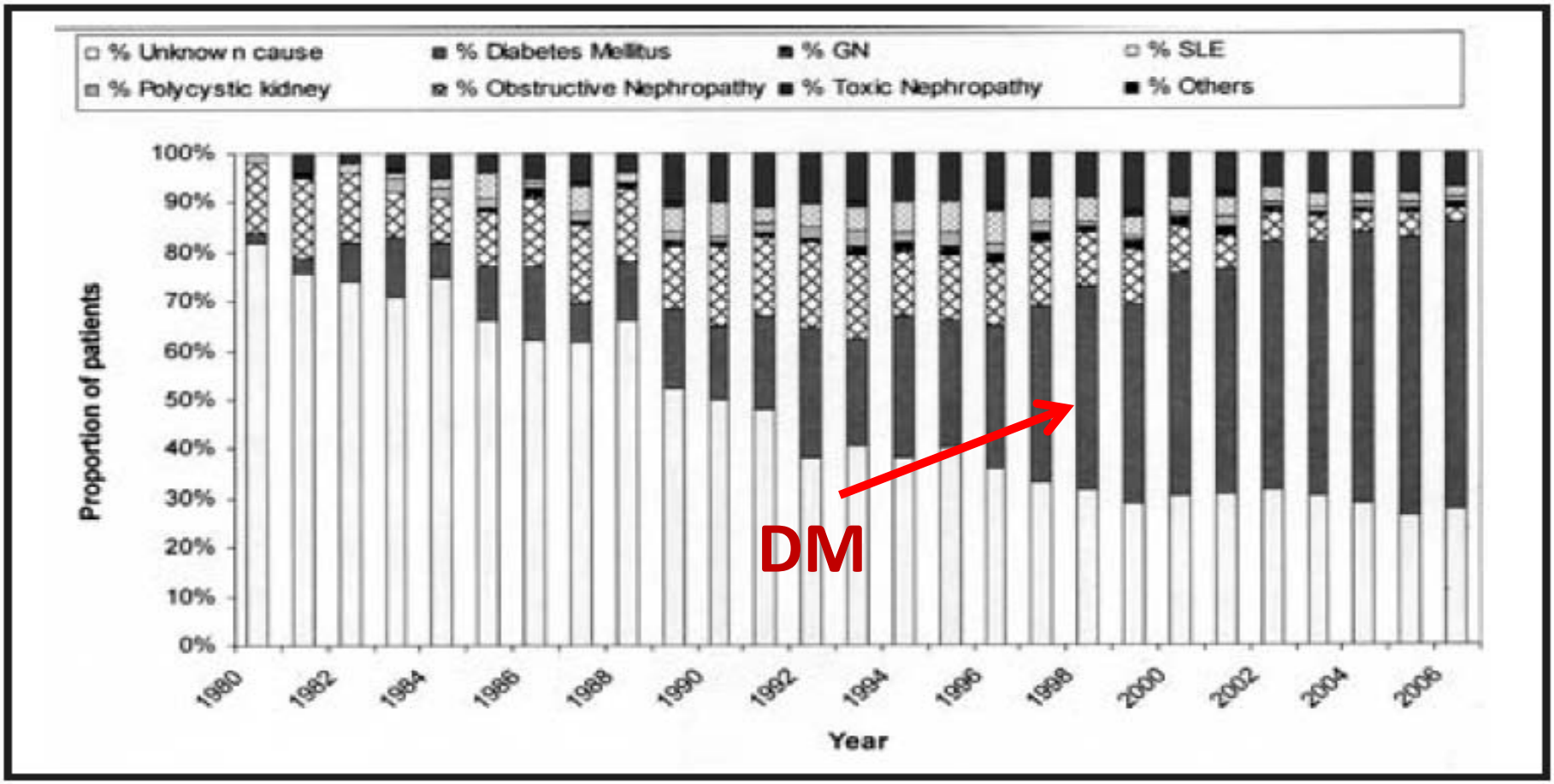
## Incidence Causes of ESRD




AfCKDi WG3

# Primary Renal Diseases in Malaysia

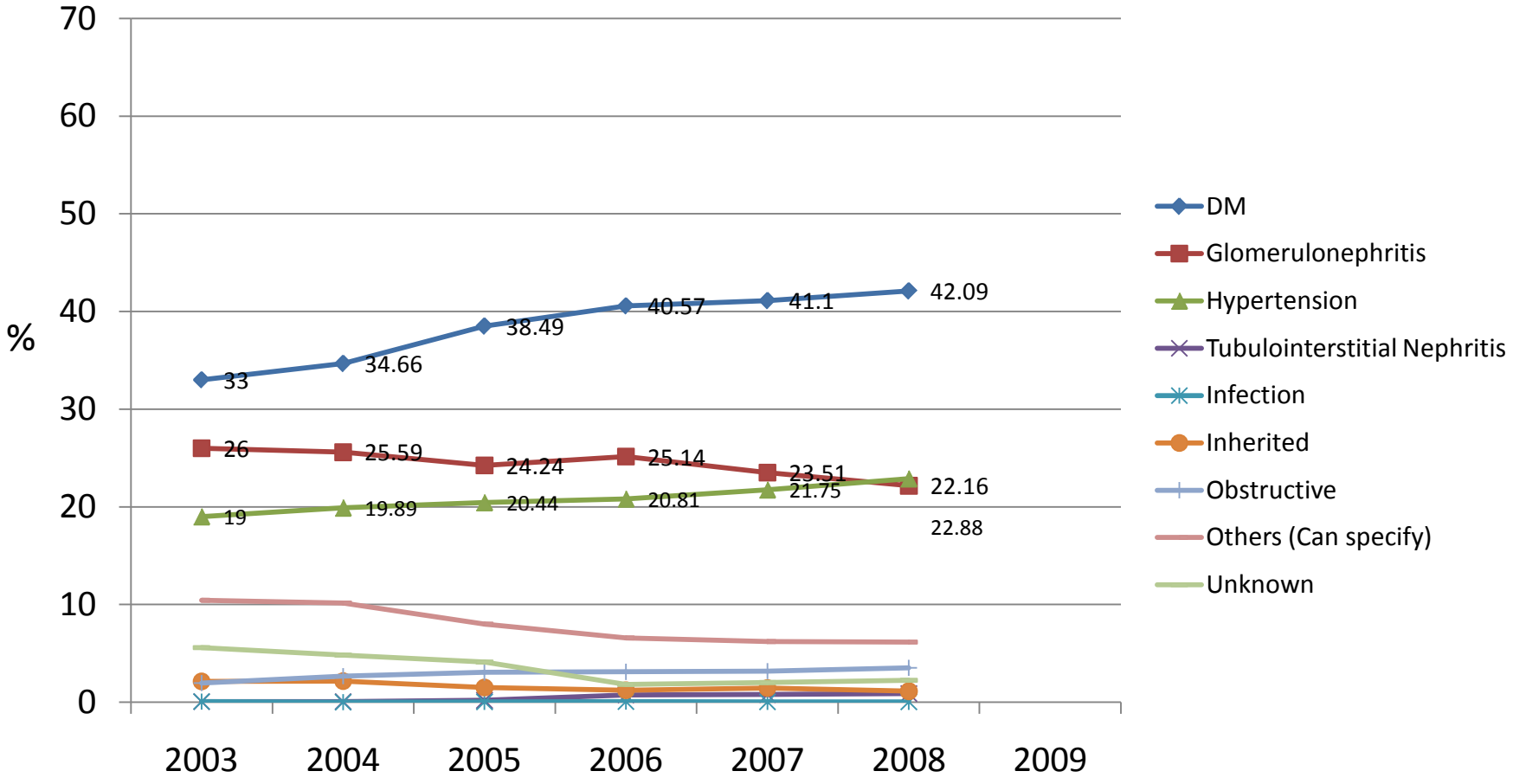
## Increasing Diabetes 1980-2006




Lim YN, Med J Malaysia Vol 63 Supplement C September 2008

# Philippines

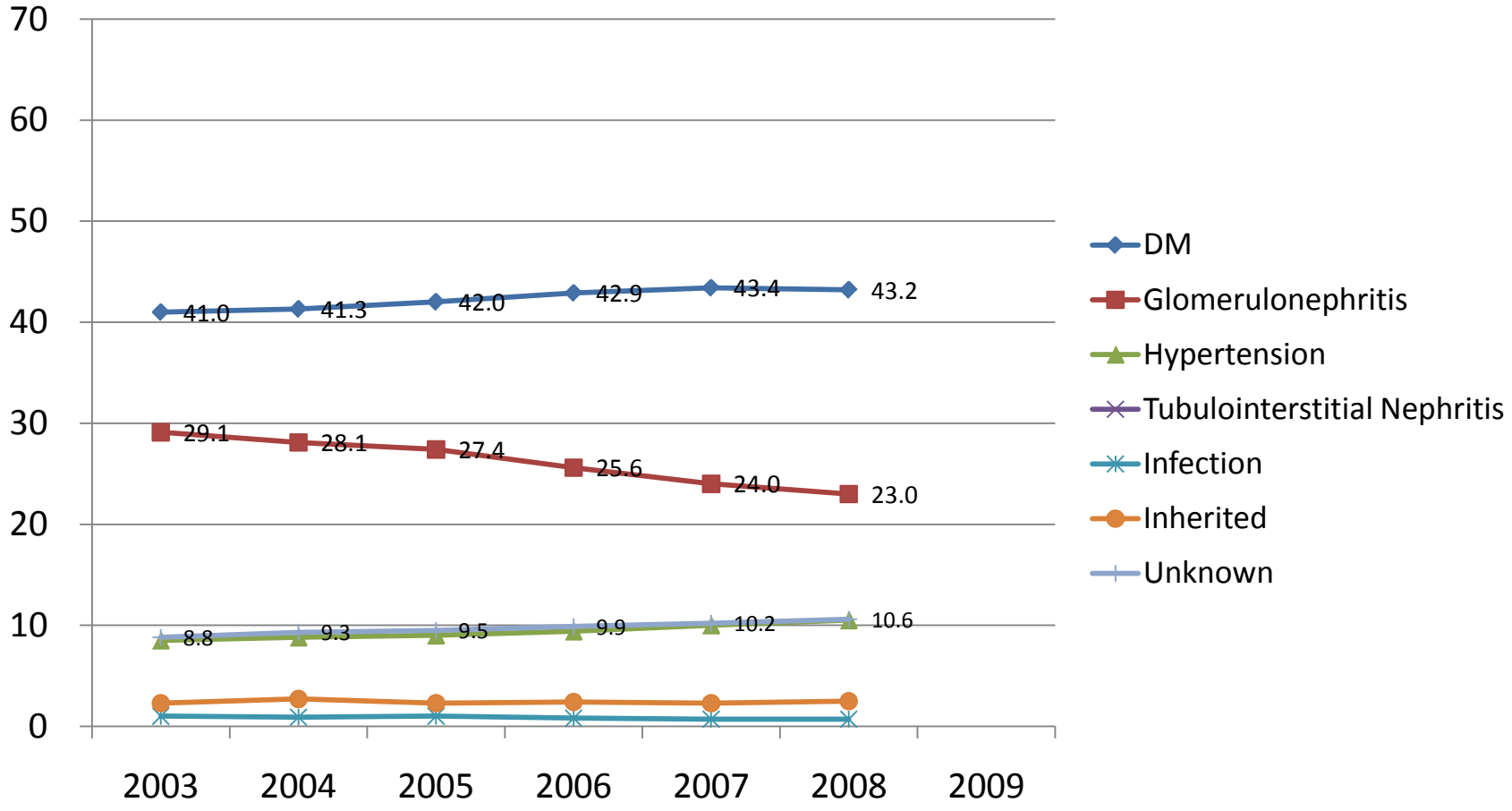
## Incidence Causes of ESRD




AfCKDi WG3

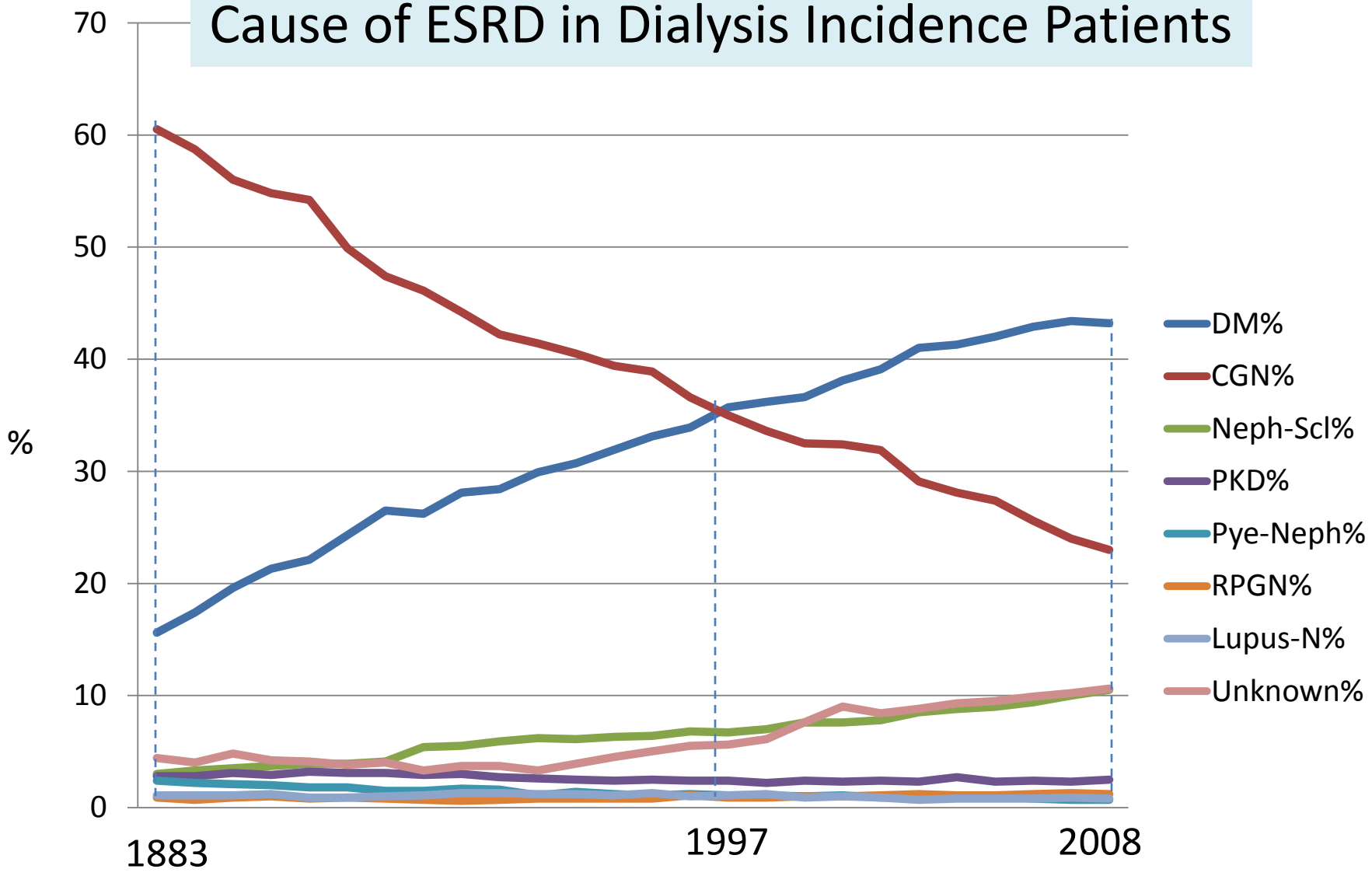
# Japan

## Incidence Causes of ESRD




AfCKDi WG3

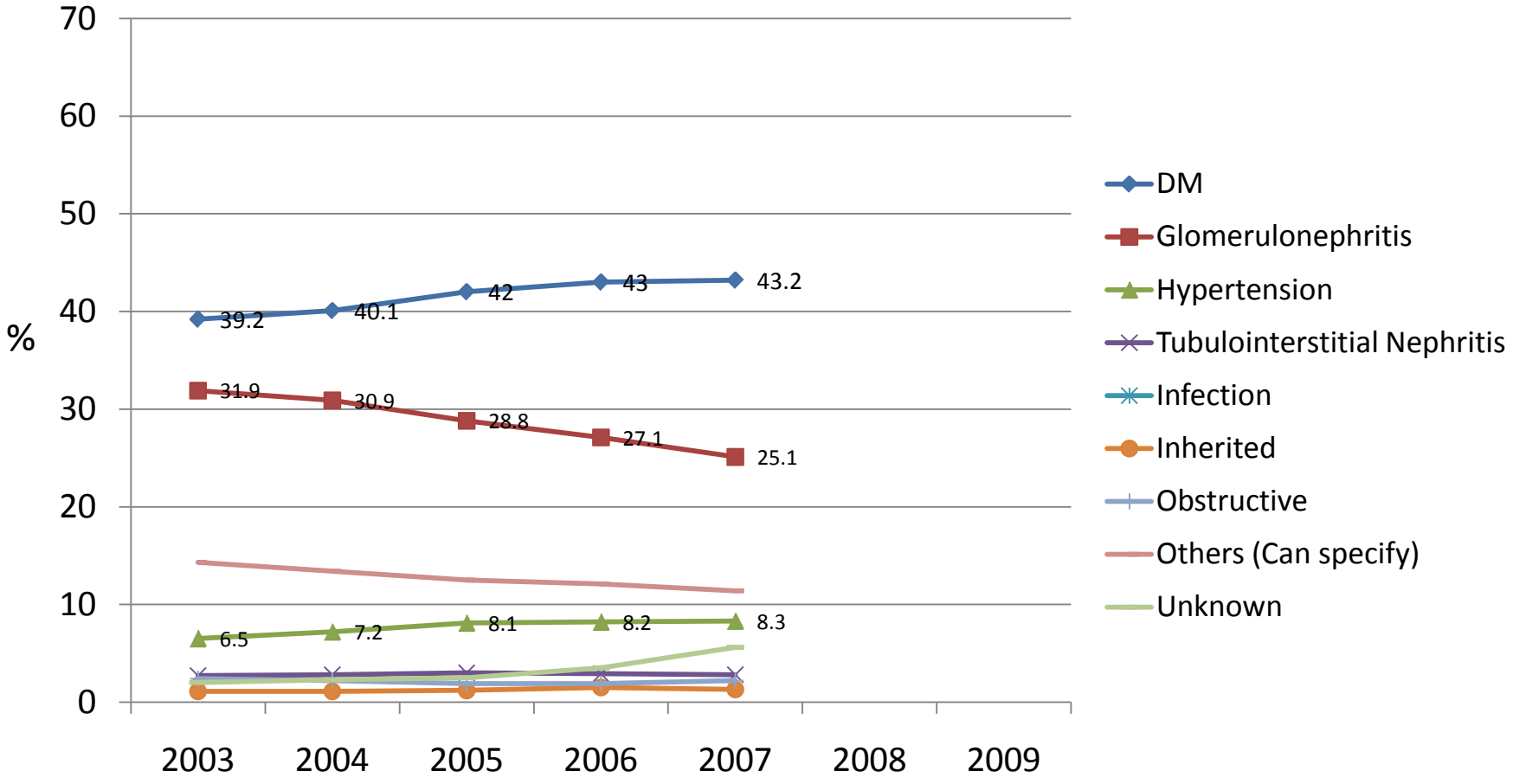
# ESRD in Japan from JSDT Registry
## Cause of ESRD in Dialysis Incidence Patients




Diabetes is the Leading Cause of ESRD in Japan since 1997

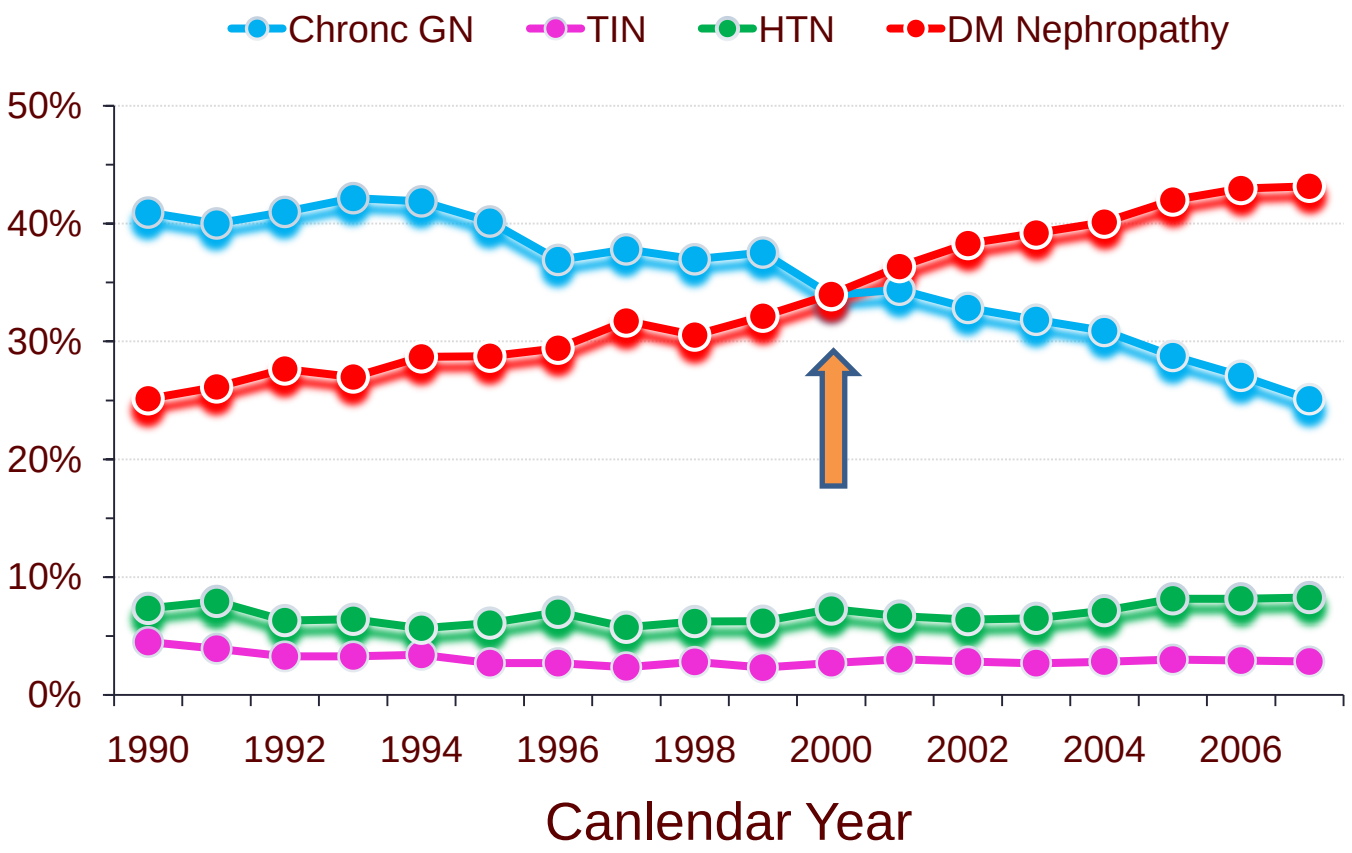
# Taiwan

## Incidence Causes of ESRD




AfCKDi WG3

# Diabetes, the Leading Cause of ESRD in Taiwan since 2000

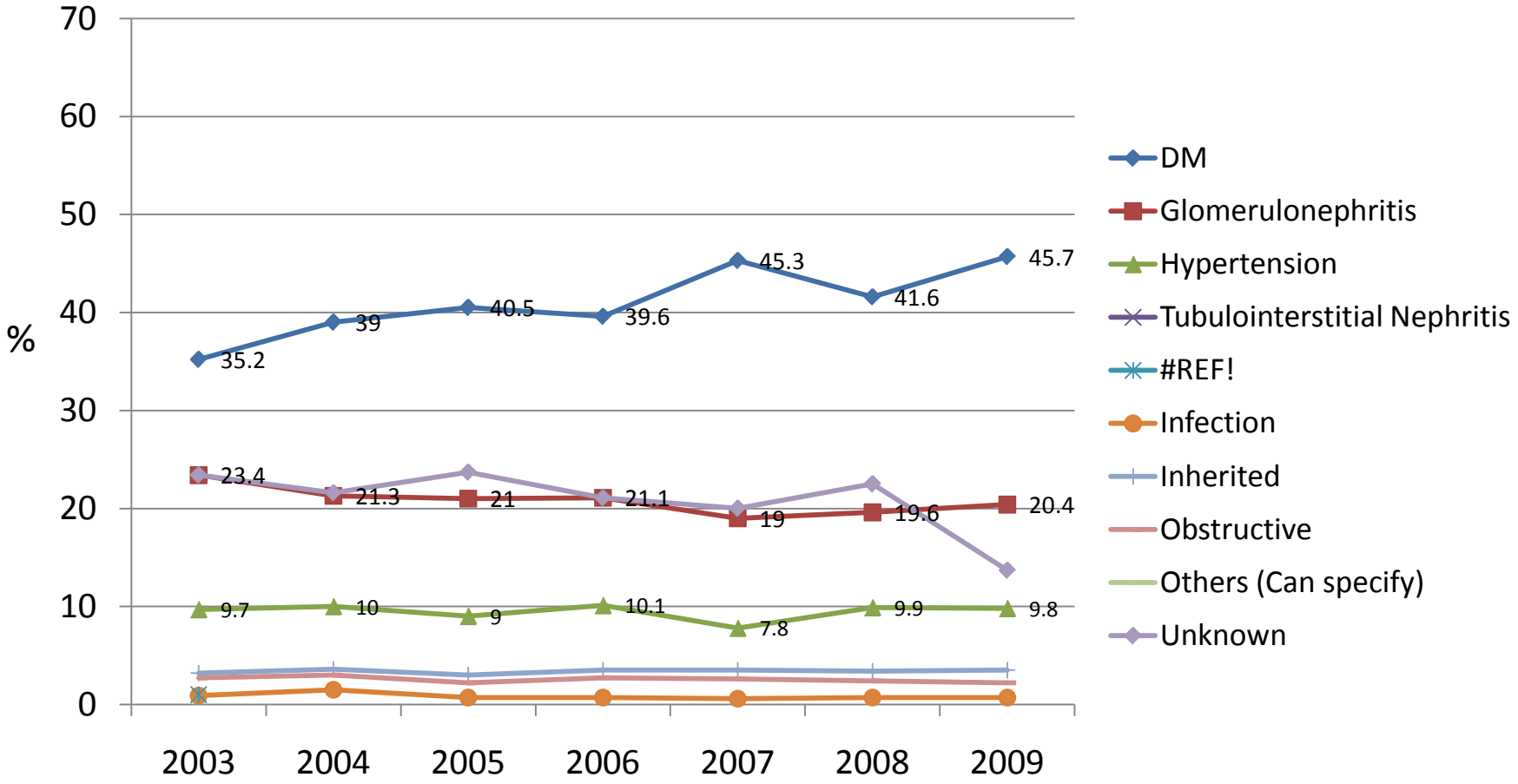



*TSN Renal Registry*
*1990~2001*

Yang WC & Hwang SJ,
NDT, 2008

# Hong Kong

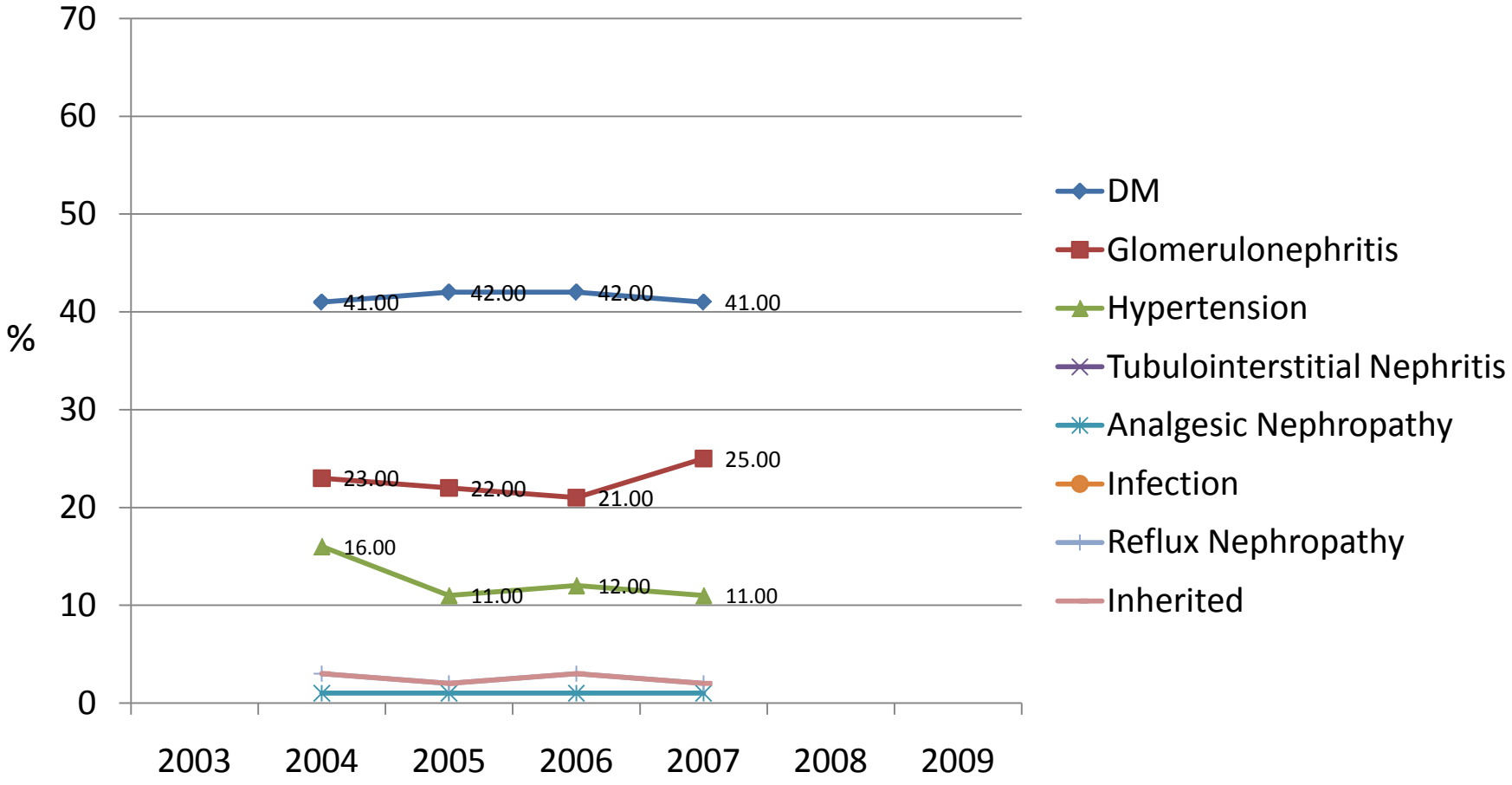
## Incidence Causes of ESRD




AfCKDi WG3

# New Zealand

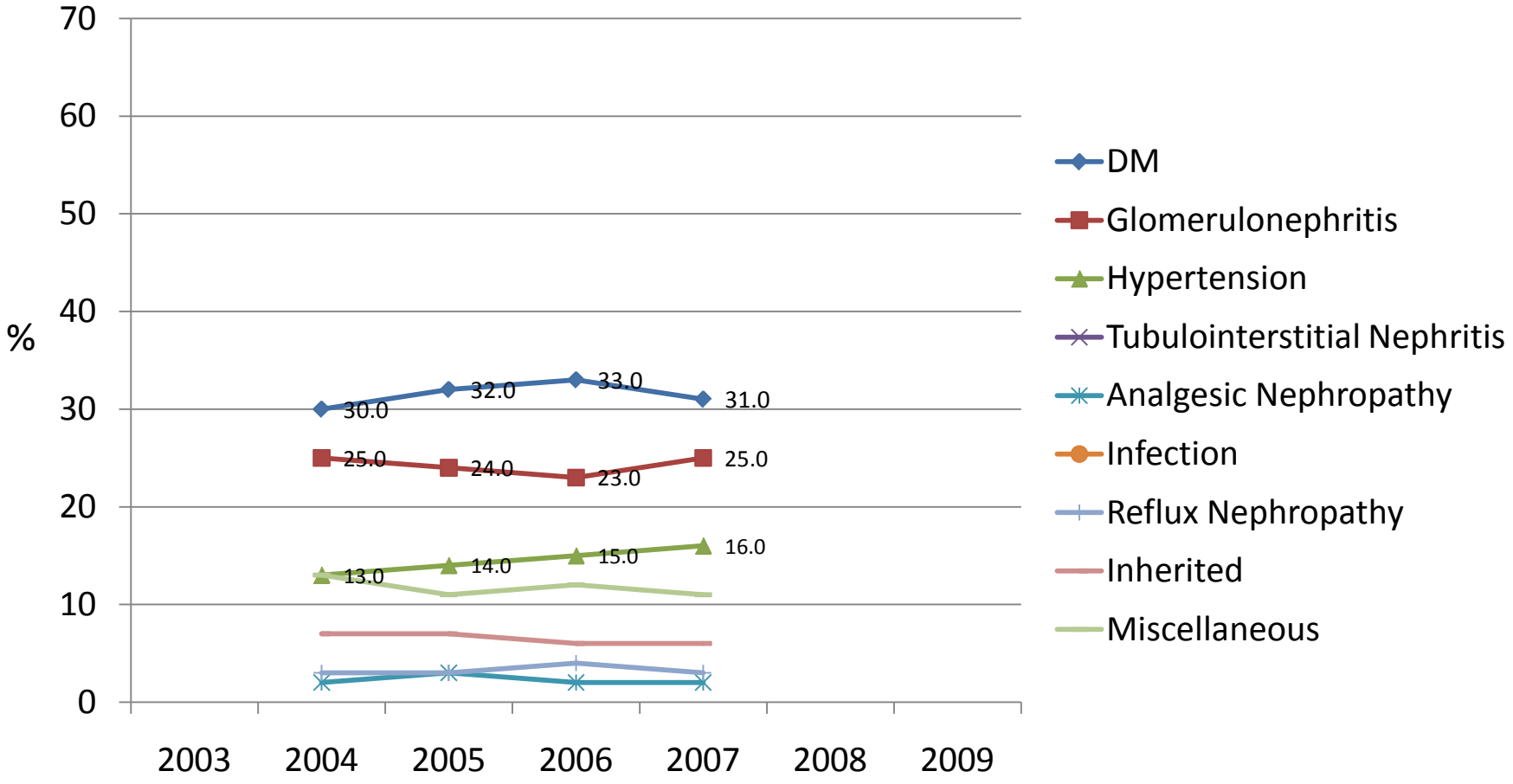
## Incidence Causes of ESRD




AfCKDi WG3

# Australia

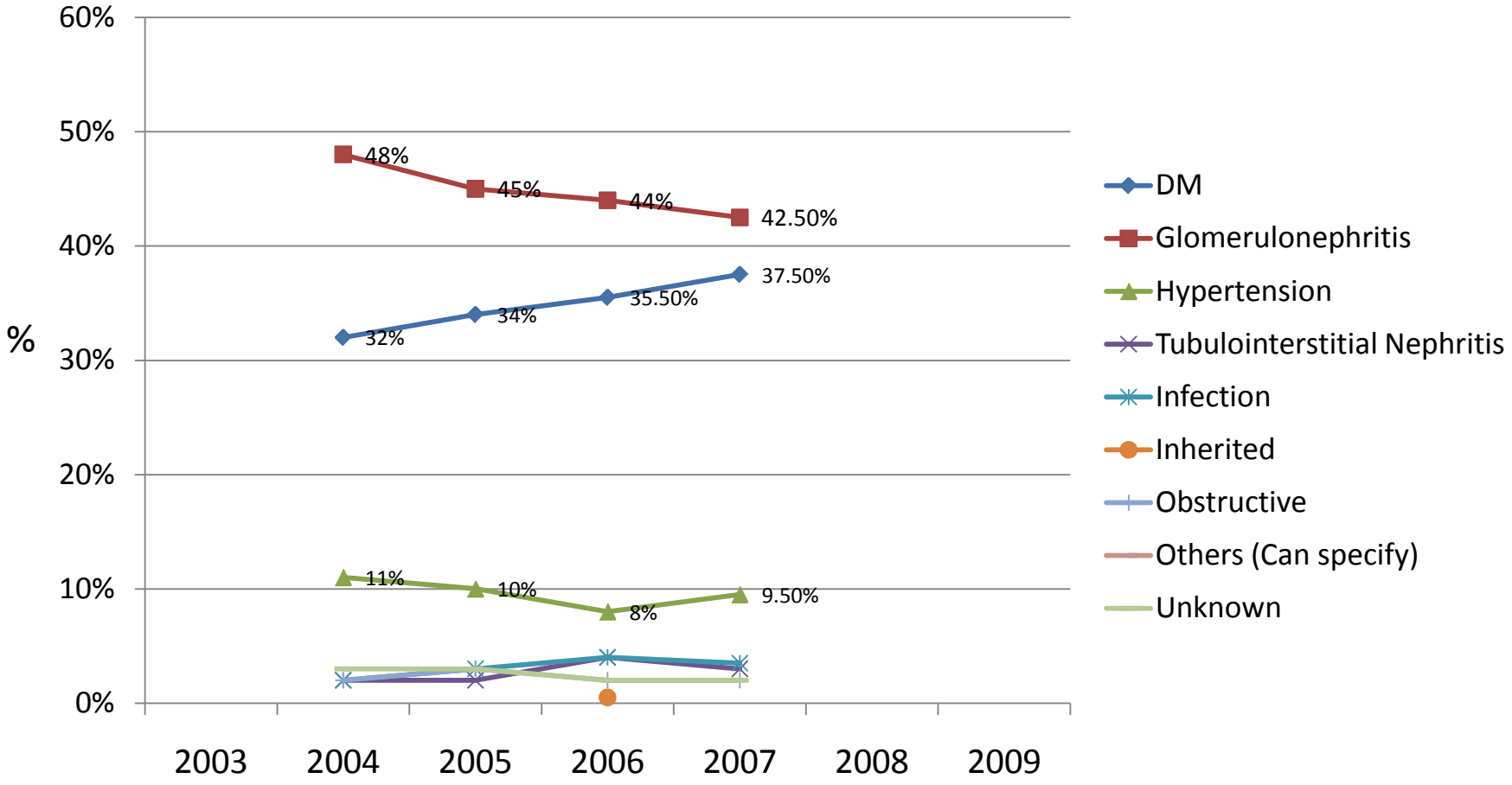
## Incidence Causes of ESRD




AfCKDi WG3

# Bangladesh

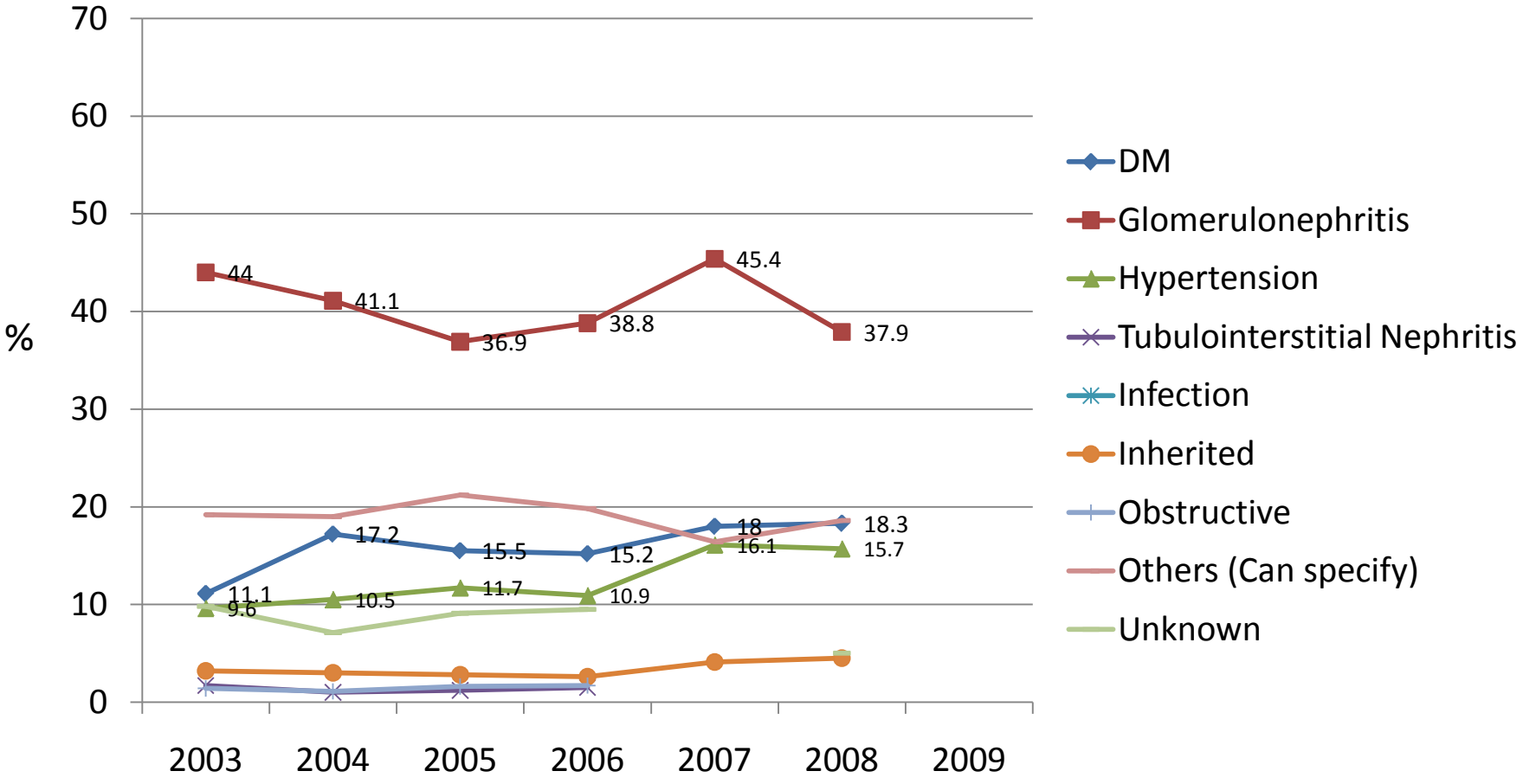
## Incidence Causes of ESRD




AfCKDi WG3

# Shanghai

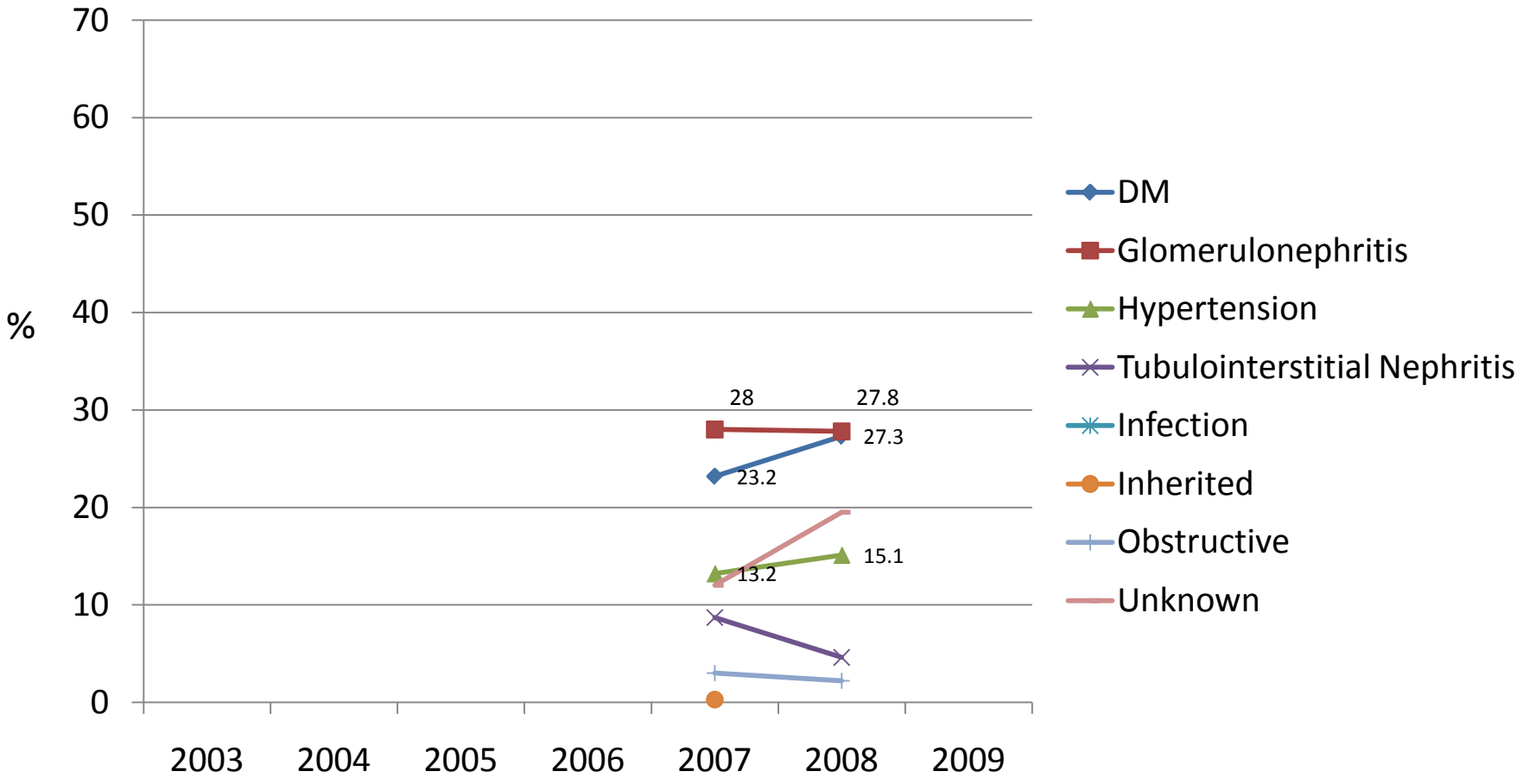
## Incidence Causes of ESRD




AfCKDi WG3

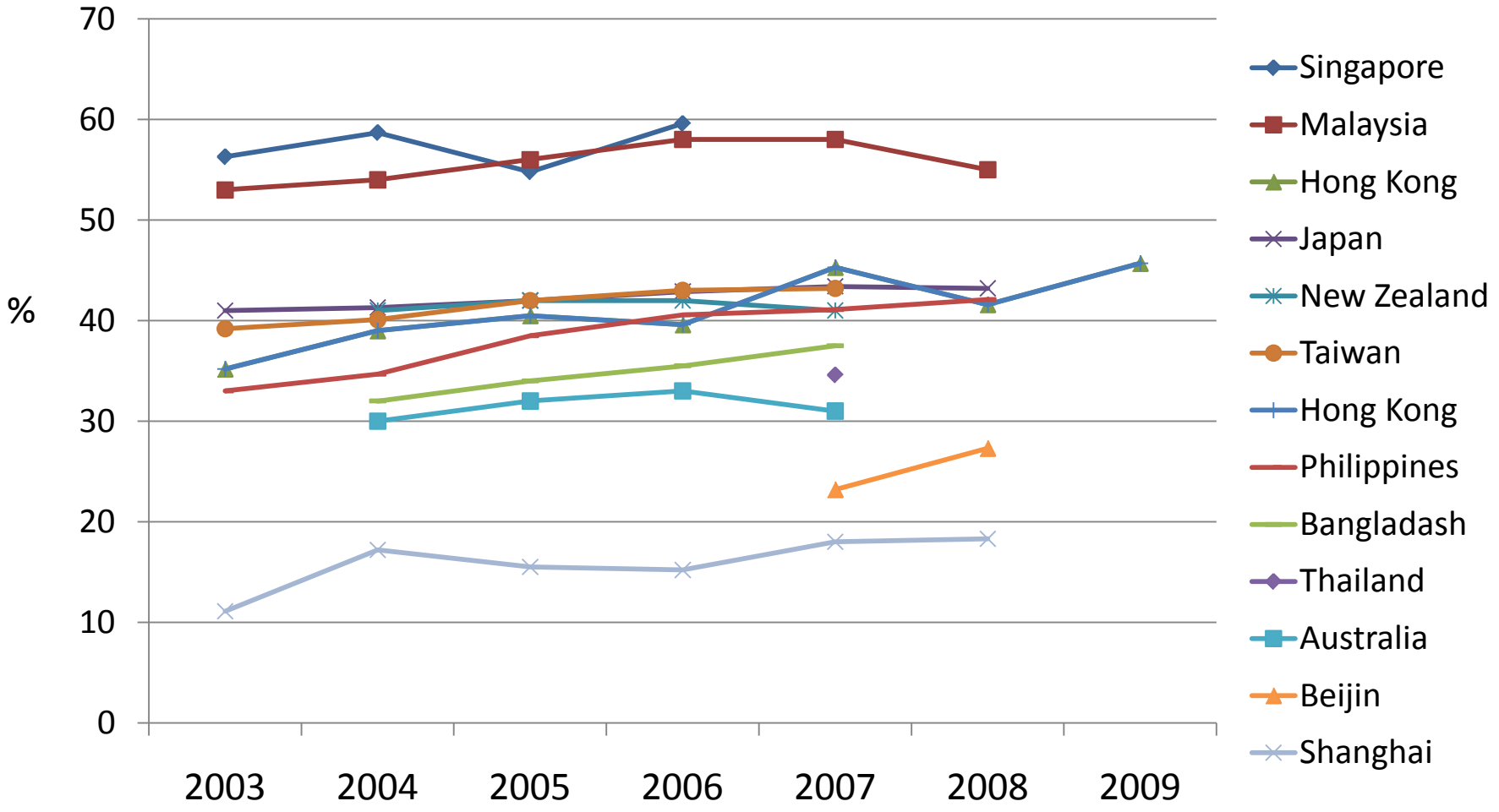
# Beijing

## Incidence Causes of ESRD



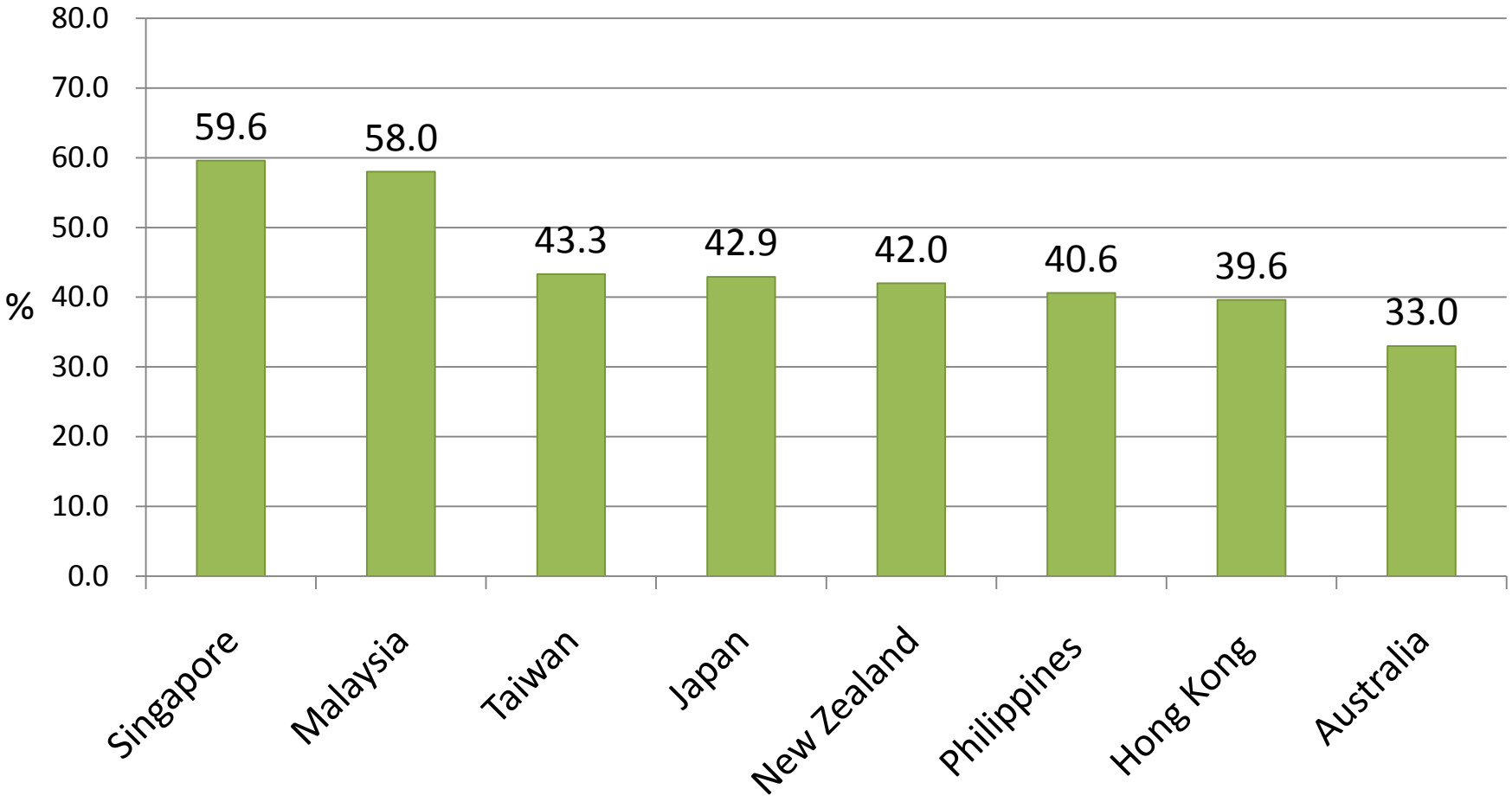

AfCKDi WG3

# Diabetes Incidence as a Cause of ESRD in Asia



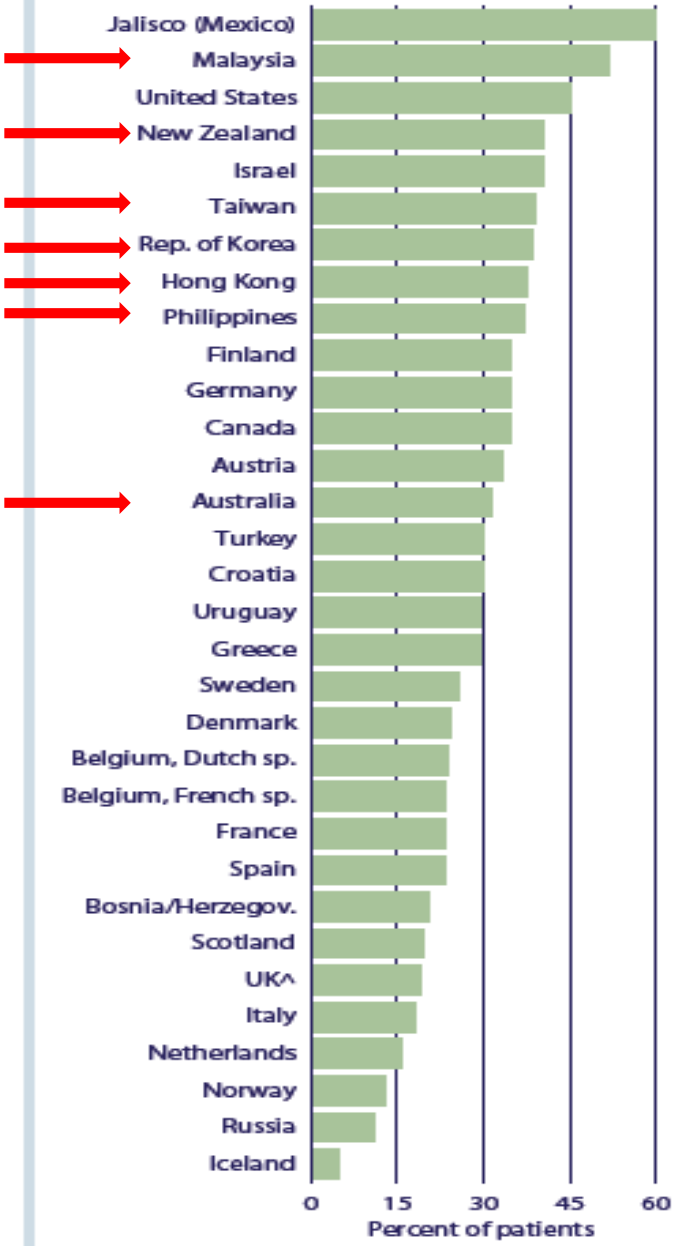

AfCKDi WG3

# Diabetes as the leading Cause of ESRD 2006




AfCKDi WG3

Asian Countries have high incidence of DM



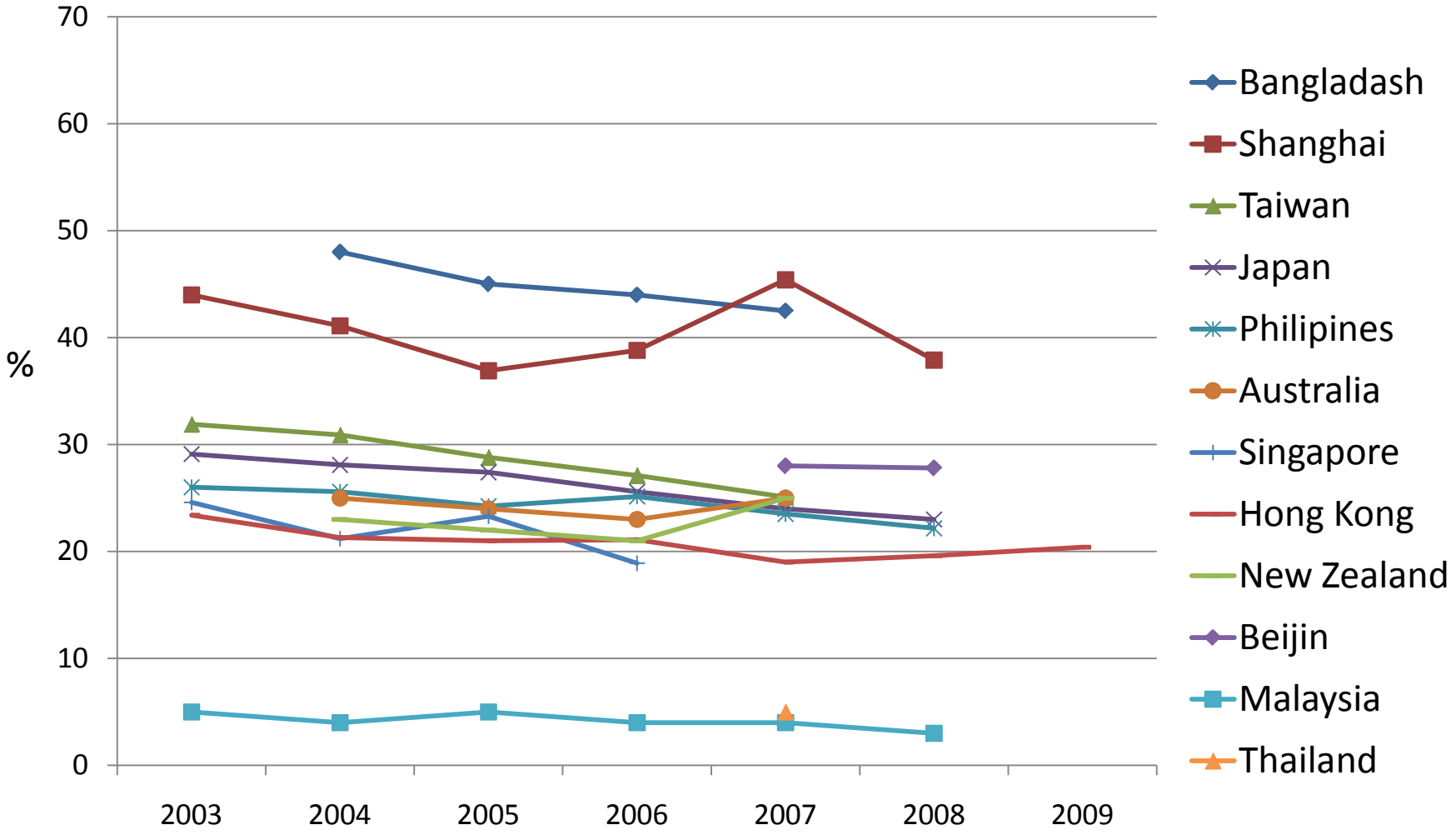

12.4 **Percentage of inddent patients with ESRD due to diabetes, 2005**

## Percentage of Incident patients with ESRD due to Diabetes, 2005 USRDS

| | 01 | 02 | 03 | 04 | 05 |
|---|---|---|---|---|---|
| Australia | 25.3 | 26.7 | 25.8 | 30.1 | 31.5 |
| Austria | 32.3 | 34.5 | 33.4 | 32.3 | 33.3 |
| Belgium/Dutch sp. | 23.8 | 22.4 | 23.7 | 24.4 | 23.8 |
| Belgium/French sp. | 20.7 | 22.5 | 24.8 | 21.2 | 23.6 |
| Bosnia & Herzegovina | . | . | 22.9 | 20.1 | 20.6 |
| Canada | 33.5 | 33.6 | 33.8 | 35.0 | 34.9 |
| Croatia | 28.7 | 28.8 | 26.9 | 29.0 | 30.0 |
| Denmark | 22.6 | 26.3 | 22.5 | 21.8 | 24.1 |
| Finland | 33.9 | 39.1 | 34.9 | 32.9 | 34.9 |
| France | . | . | . | . | 23.3 |
| Germany | 35.7 | 36.2 | 36.3 | 34.2 | 34.9 |
| Greece | 26.8 | 26.8 | 28.0 | 28.3 | 29.4 |
| Hong Kong | . | 33.3 | 33.3 | 35.7 | 37.4 |
| Hungary | 21.1 | 26.2 | 25.5 | 29.5 | . |
| Iceland | 18.2 | 9.5 | 0.0 | 4.5 | 5.0 |
| Israel | . | 39.3 | 40.2 | 42.6 | 40.2 |
| Italy | 16.4 | 16.3 | 16.2 | 16.2 | 18.0 |
| Jalisco (Mexico) | 52.0 | 51.0 | 51.0 | 56.0 | 60.0 |
| Japan | 38.1 | 38.7 | 40.7 | 41.0 | . |
| Rep. of Korea | 41.5 | 40.7 | 42.5 | 43.4 | 38.5 |
| Malaysia | 45.9 | 49.1 | 51.7 | 54.7 | 52.0 |
| Netherlands | 16.2 | 17.4 | 16.6 | 17.3 | 15.7 |
| New Zealand | 37.9 | 44.5 | 41.1 | 40.4 | 40.6 |
| Norway | 14.5 | 11.9 | 15.8 | 17.3 | 12.9 |
| Pakistan | . | 40.0 | 40.0 | . | . |
| Philippines | 24.8 | 28.5 | 32.8 | 33.5 | 36.9 |
| Poland | 22.2 | 24.1 | 22.6 | . | . |
| Russia | 11.4 | 9.0 | 10.7 | . | 11.0 |
| Scotland | 18.1 | 18.5 | 19.0 | 17.7 | 19.7 |
| Spain | . | . | . | 17.5 | 23.2 |
| Sweden | 25.3 | 23.8 | 24.1 | 24.9 | 25.9 |
| Taiwan | 38.7 | 38.9 | 39.2 | 38.8 | 39.2 |
| Turkey | 26.3 | 46.2 | 23.1 | 21.3 | 30.2 |
| UK^ | . | . | . | . | 19.0 |
| United States | 46.3 | 45.7 | 45.8 | 45.8 | 45.1 |
| Uruguay | 21.2 | 20.0 | 29.6 | 21.8 | 29.6 |

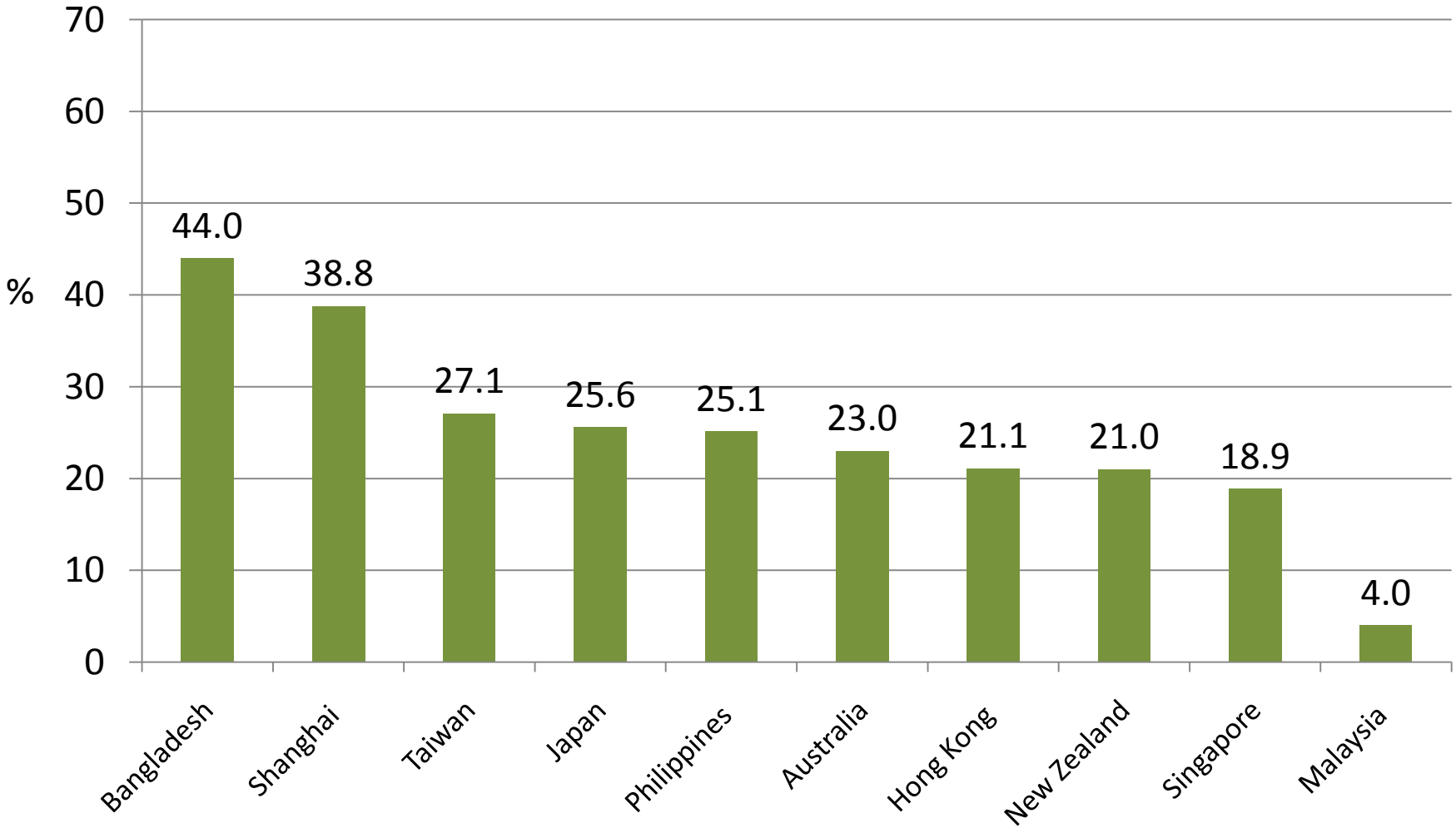
12.b **Percentage of inddent patients with ESRD due to diabetes**

# CGN Incidence as a Cause of ESRD in Asia



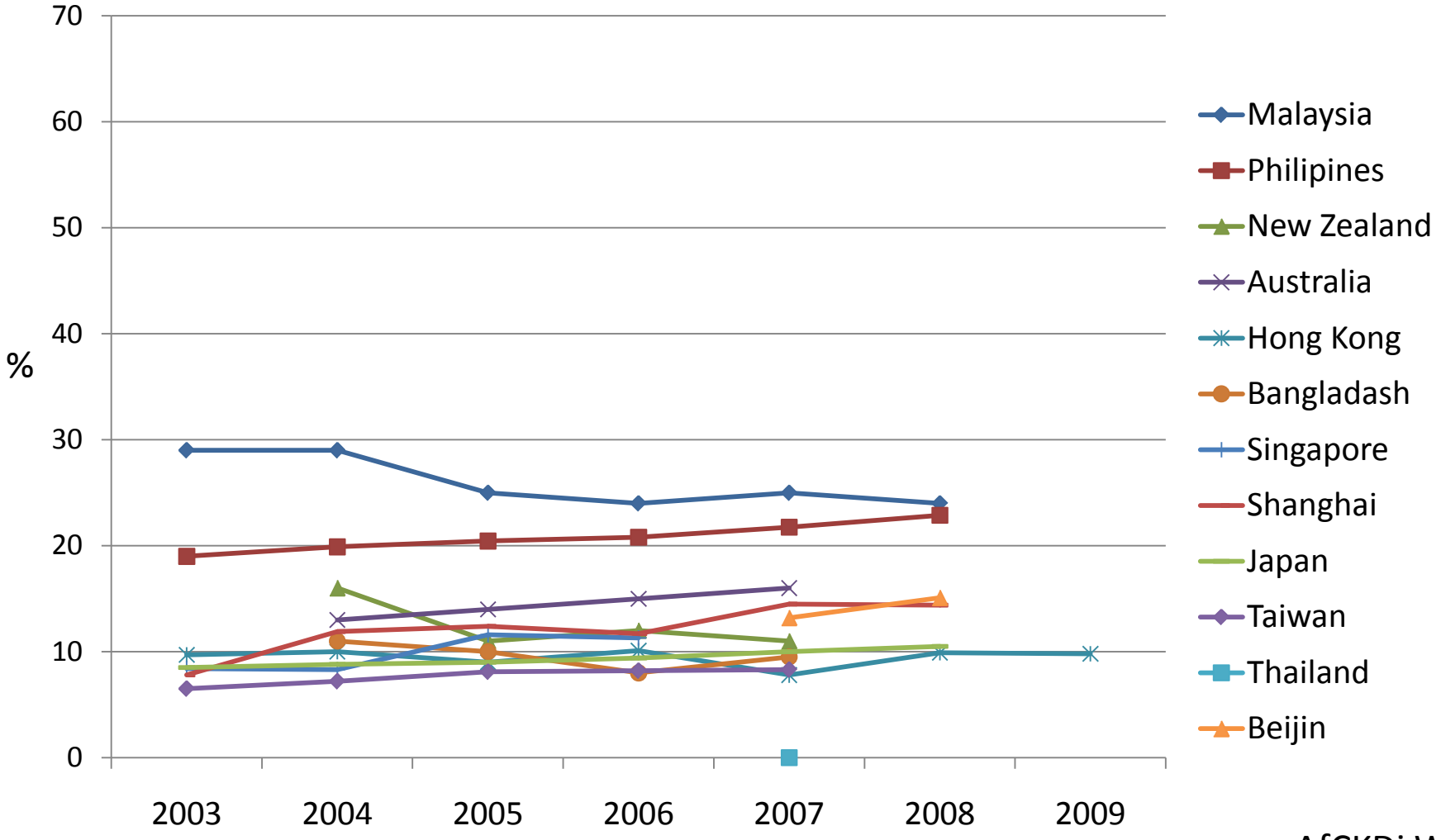

AfCKDi WG3

# CGN as the Cause of ESRD 2006



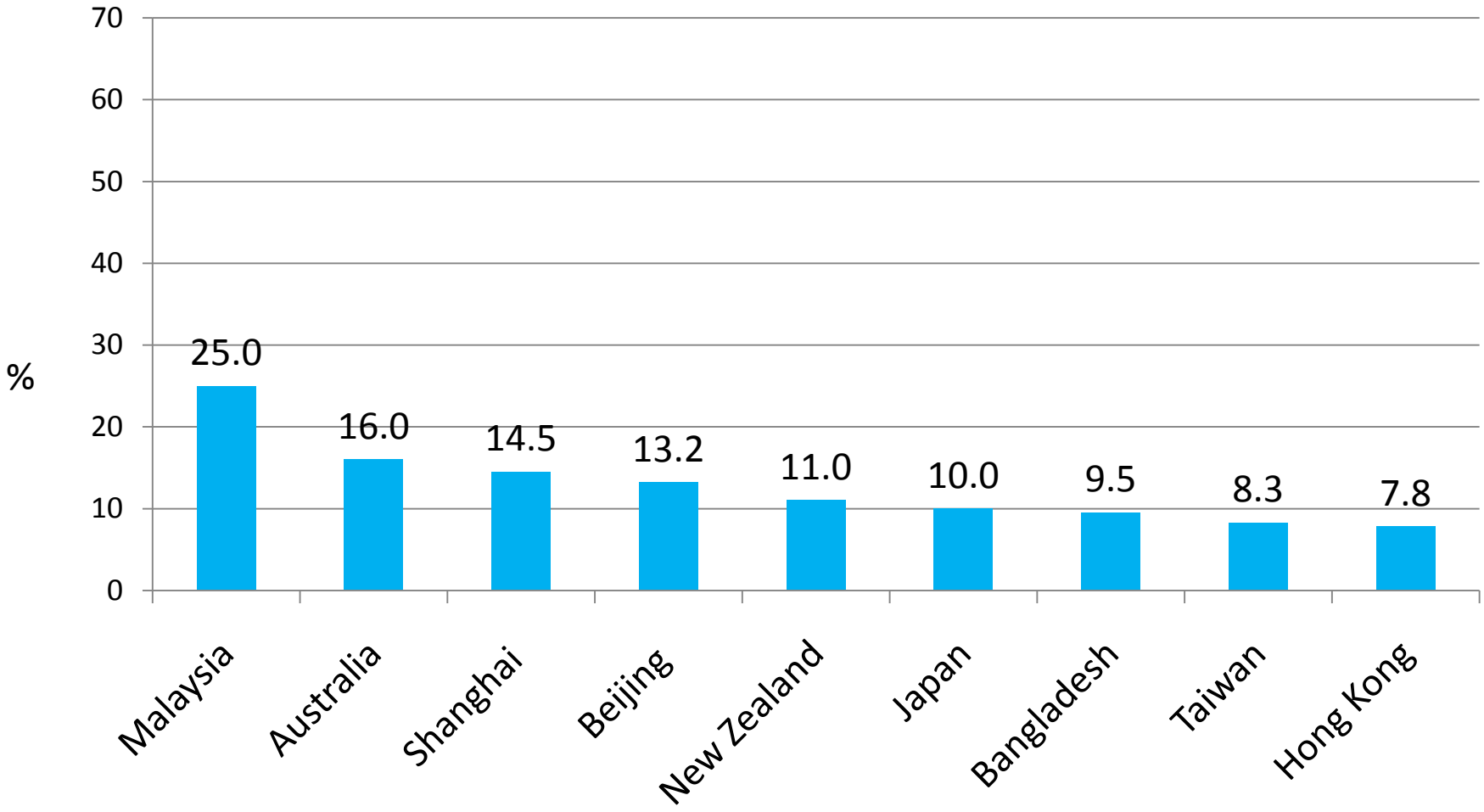

AfCKDi WG3

# Hypertension Incidence as a Cause of ESRD in Asia



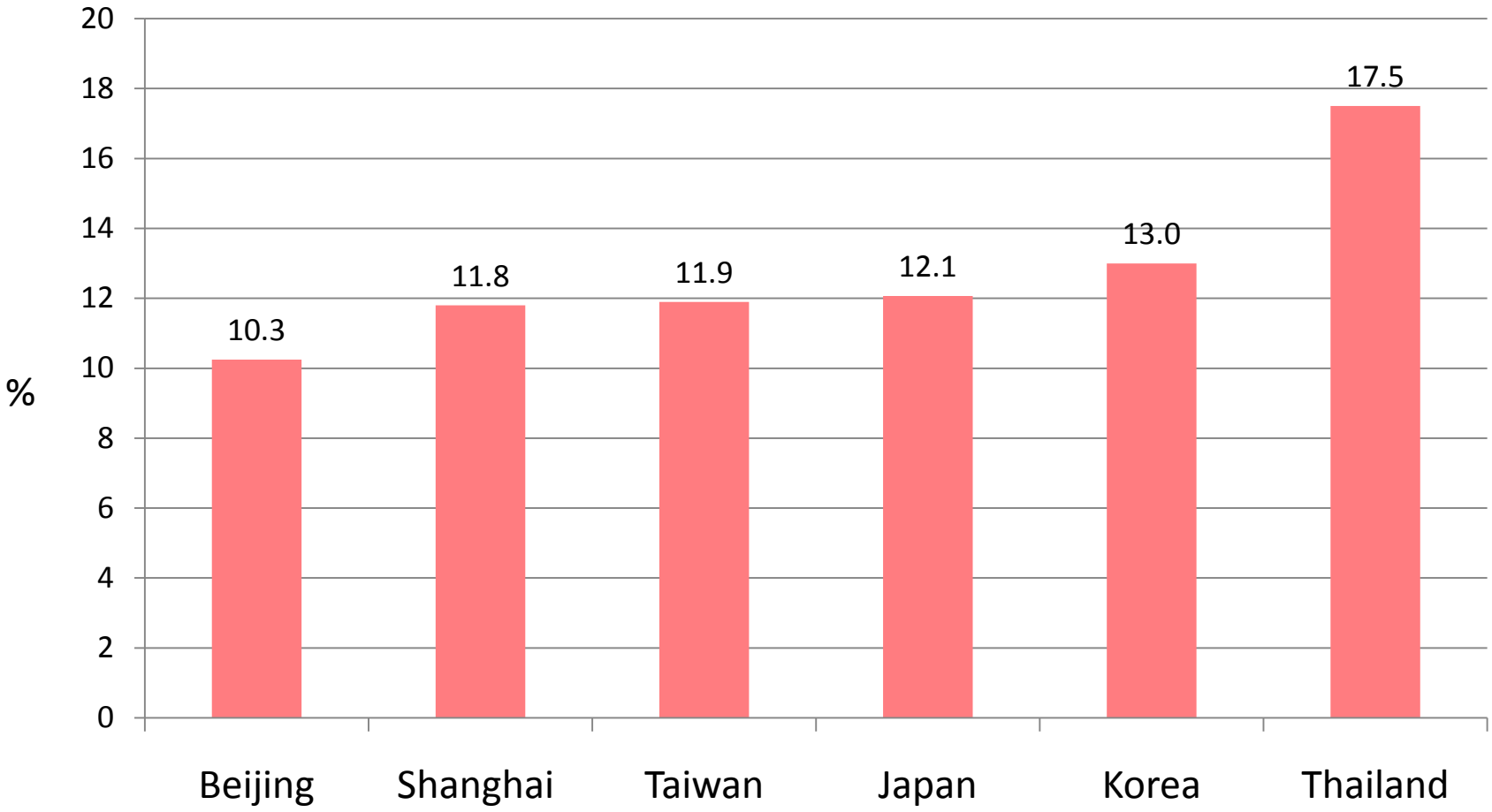

AfCKDi WG3

# Hypertension as the Cause of ESRD 2006




AfCKDi WG3

# Prevalence of CKD in Asia




Data from AfCKDi WG3

# Malaysia

- The Malaysian dialysis registry has demonstrated the rapid growth of dialysis provision in this country.
- This has been particularly dramatic in the older age groups.
- It has also shown that diabetic nephropathy leading to ESRD is on the rise and accounts for more than 50% of all incident dialysis patients.
- Hence prevention of ESRD is eminently achievable with better management of diabetes mellitus.

Lim YN, Med J Malaysia Vol 63 Supplement C September 2008

# Singapore

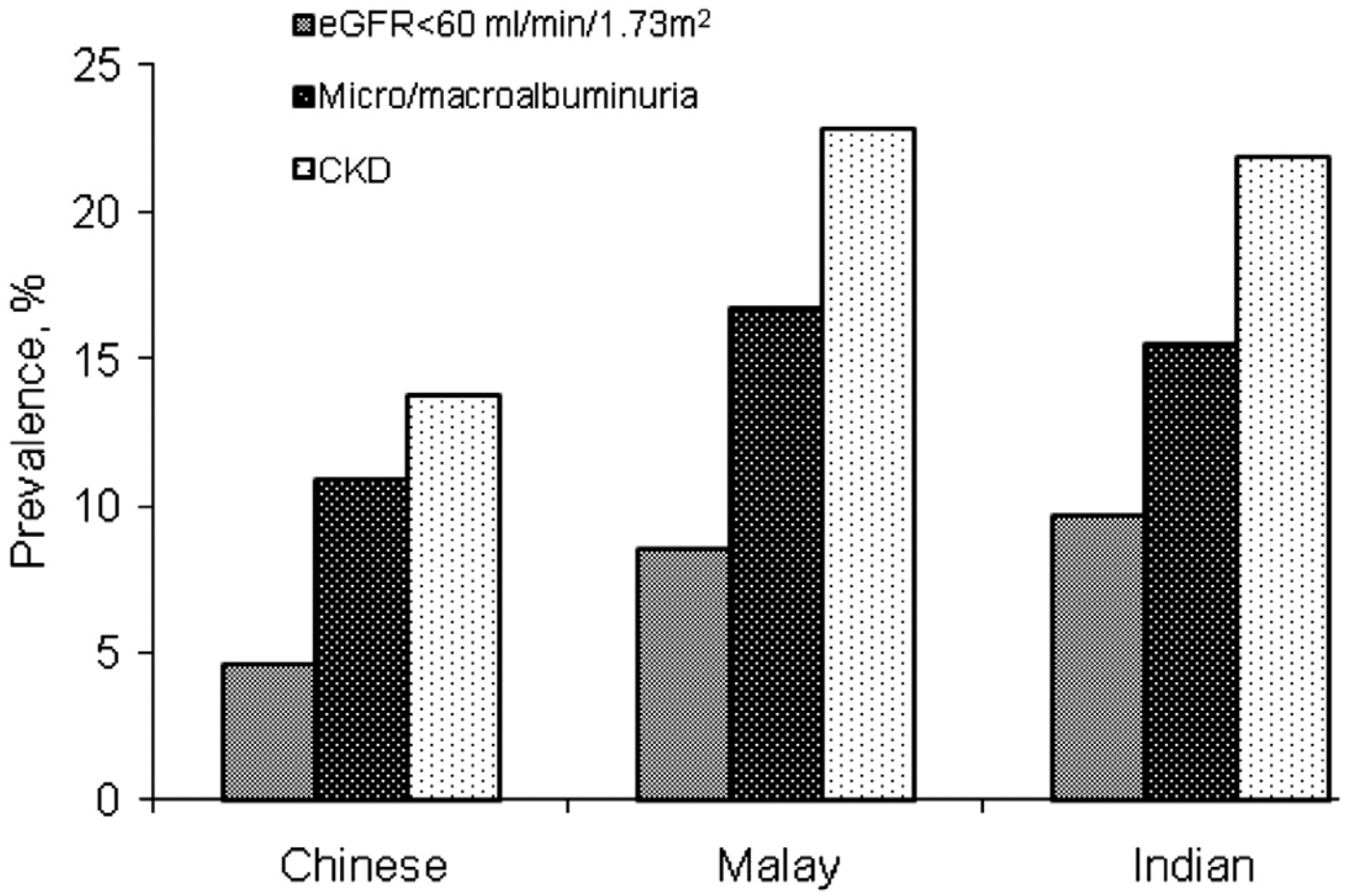
## Ethnic disparities in prevalence and impact of risk factors of chronic kidney disease

- Aimed to assess the prevalence and risk factors of CKD in a multi-ethnic Asian population in Singapore.
- 4499 participants, aged 24-95 years.
- The age, sex-standardized prevalence of CKD was 12.8% (11.4%, 18.6% and 17.6% in Chinese, Malays and Indians).
- Older age and the presence of diabetes, hypertension and dyslipidemia were significantly associated with CKD in all ethnic groups.
- Diabetes (45%) and dyslipidemia (16%) among Malays and hypertension among Indians (23%) had greater population-attributable risk of CKD.

Nephrol Dial Transplant. 2010 Feb 25
Sabanayagam C, Lim SC, Wong TY, Lee J, Shankar A, Tai ES.
Department of Ophthalmology, Yong Loo Lin School of Medicine, National University of Singapore, Kent Ridge, Singapore.

# Prevalence of eGFR, albuminuria and chronic kidney disease (CKD) by ethnicity

The age, sex-standardized prevalence of CKD was 12.8%
(11.4%, 18.6% and 17.6% in Chinese, Malays and Indians).

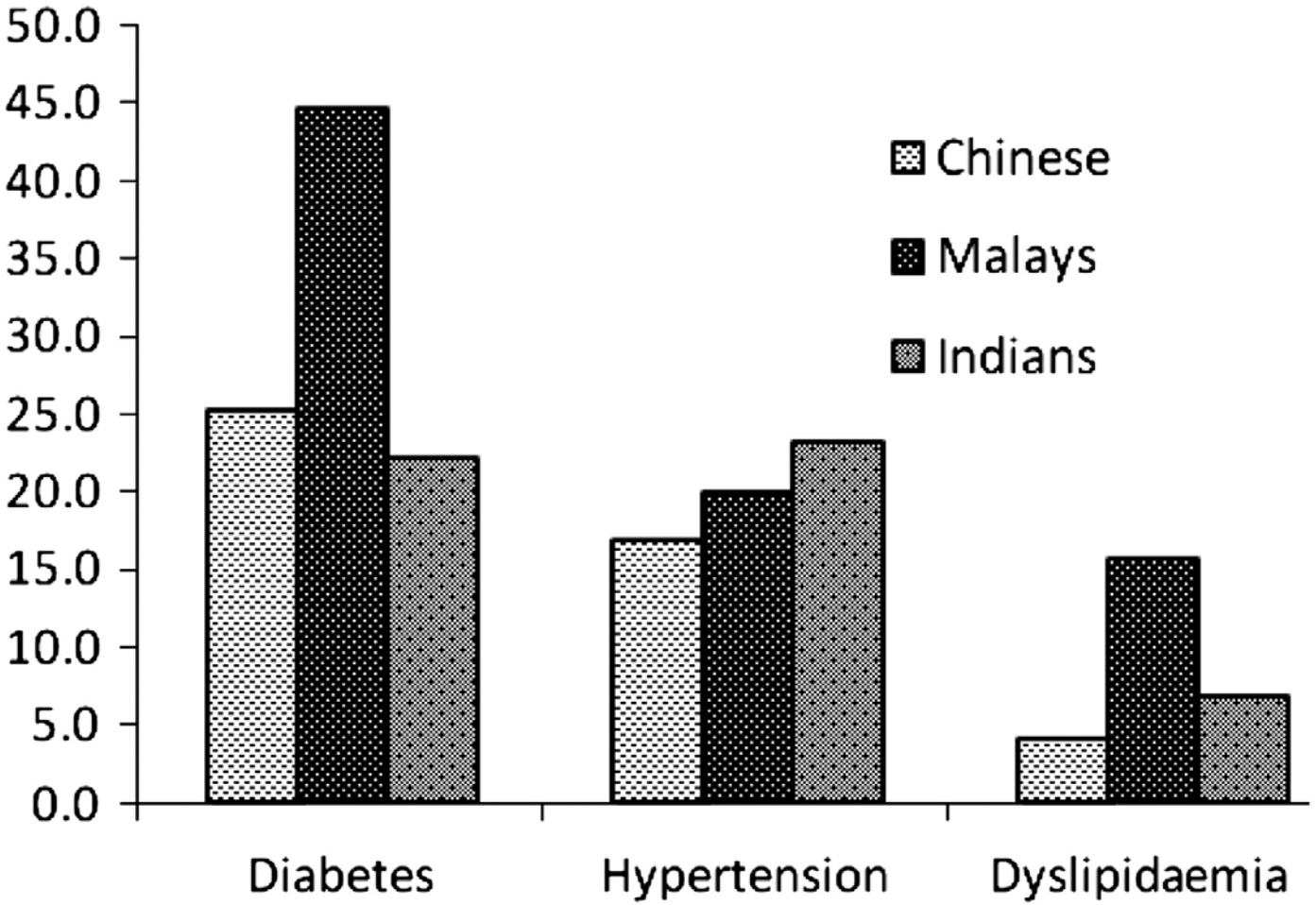



**Sabanayagam, C. et al. Nephrol. Dial. Transplant. 2010 0:gfq084v1-84; doi:10.1093/ndt/gfq084**

NDT
Nephrology Dialysis Transplantation

# Population-attributable risk for major risk factors of CKD by ethnic groups

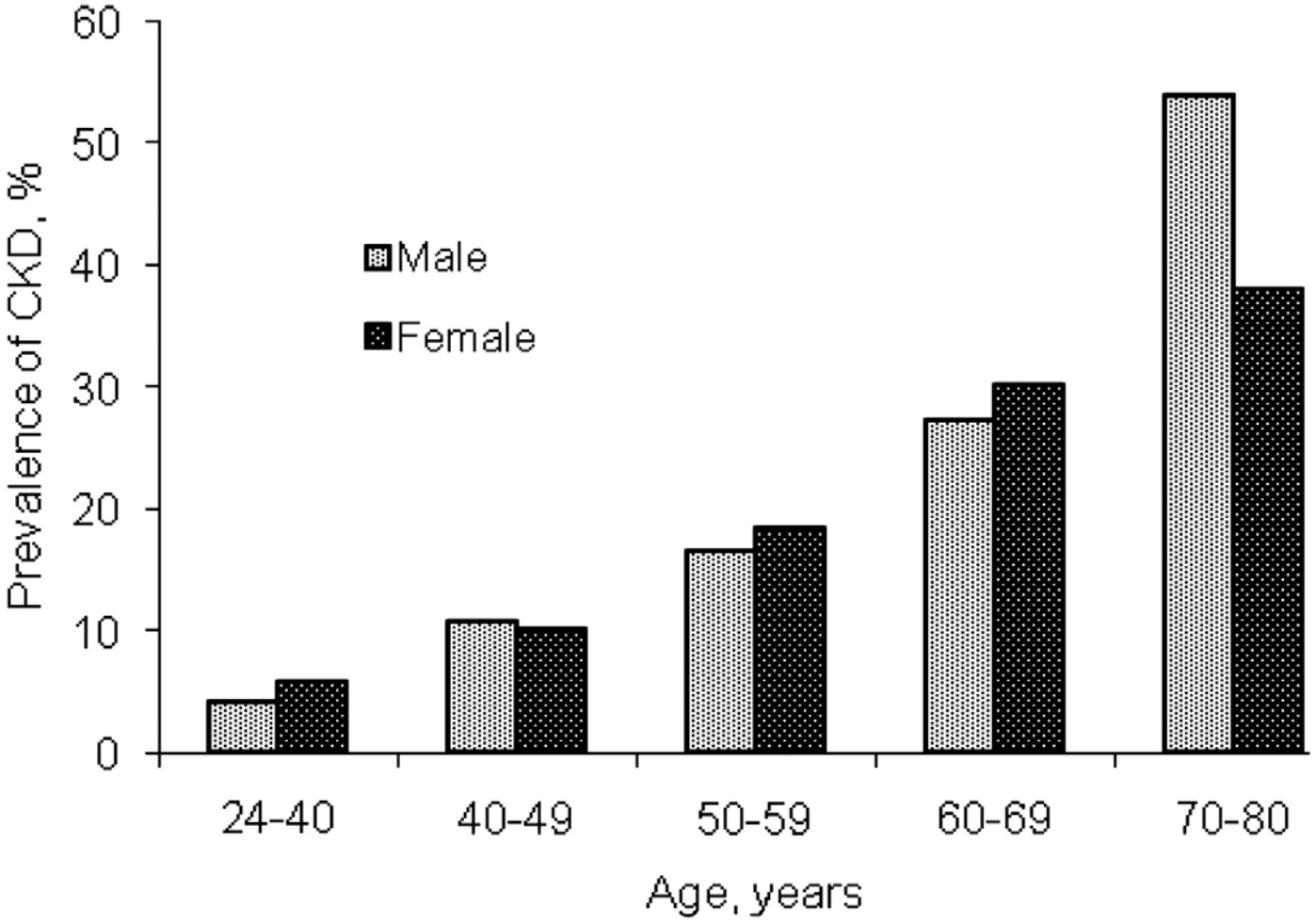
Diabetes (45%) and dyslipidaemia (16%) among Malays and hypertension among Indians (23%) had greater population-attributable risk of CKD




**Sabanayagam, C. et al. Nephrol. Dial. Transplant. 2010 0:gfq084v1-84; doi:10.1093/ndt/gfq084**

NDT
Nephrology Dialysis Transplantation

# Prevalence of CKD by age group and gender




Sabanayagam, C. et al. Nephrol. Dial. Transplant. 2010 0:gfq084v1-84; doi:10.1093/ndt/gfq084

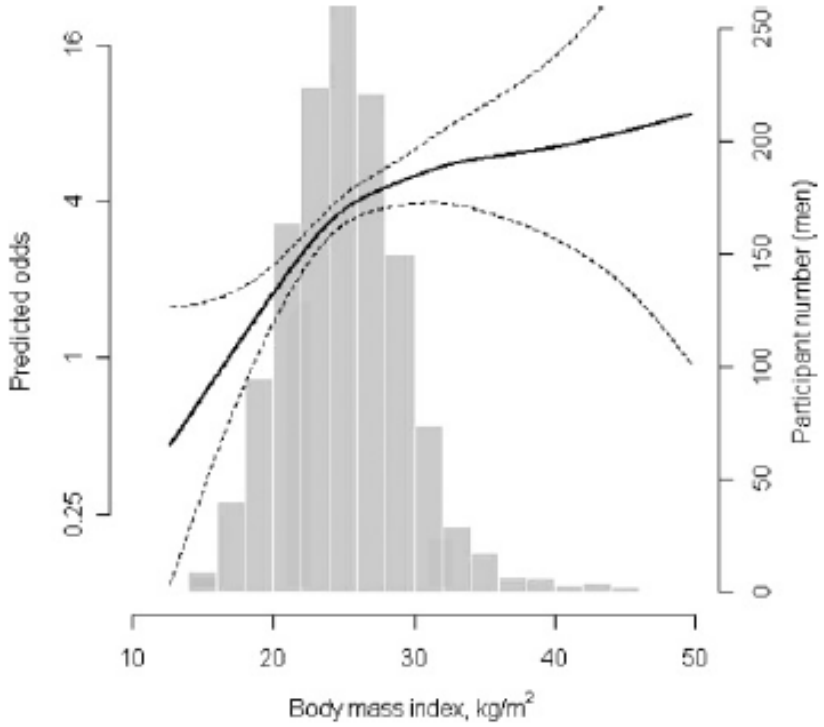
NDT Nephrology Dialysis Transplantation

# Association between body mass index and chronic kidney disease in men

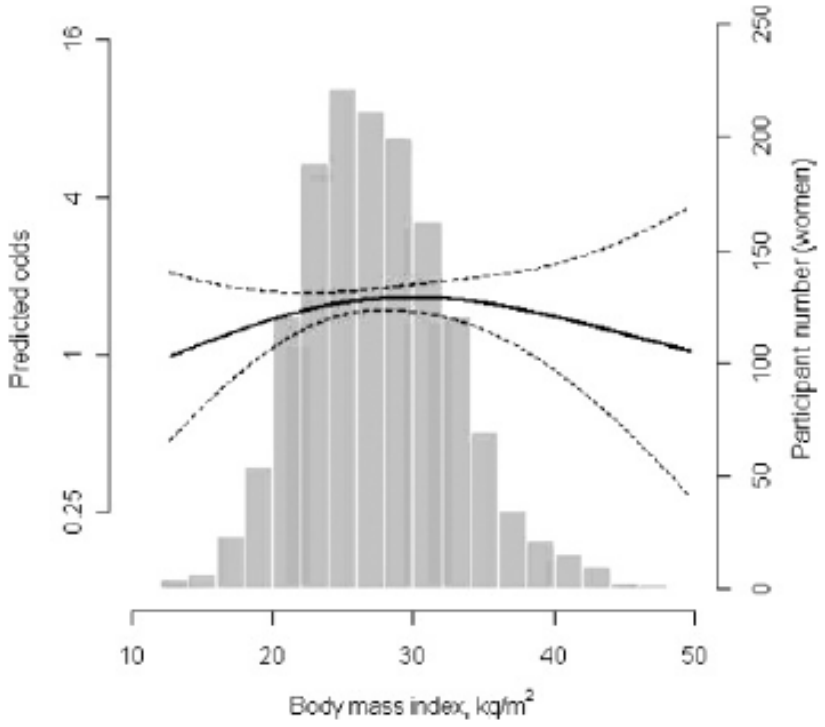
predicted odds of CKD from nonparametric logistic regression

**Malay adults in Singapore**

Male




Female




Nephrol Dial Transplant. 2008 Jun;23(6):1910-8.
Shankar A Department of Community, Occupational, and Family Medicine, Singapore General Hospital, Singapore

# Japan

## Prevalence of chronic kidney disease in the Japanese general population

574,024 (male 240,594, female 333,430) participants over 20 years old in 2005.

- The prevalence of CKD stages 1, 2, 3, and 4 + 5 were 0.6, 1.7, 10.4 and 0.2% in the study population.
- The prevalence of low GFR was significantly higher in the hypertensive and proteinuric populations.
- The prevalence rate of CKD in Japan was similar to that in the USA when the Japanese general population was age adjusted to the US 2005 population estimate.
- About 13% of the Japanese adult population-approximately 13.3 million people-were predicted to have CKD in 2005

Imai, E., and Matsuo, S. Clin.Exp.Nephrol. 13(6), 621-630. 2009.

# CKD in Japan from JSN-CKD Survey 2005

| | Male (%) | Female (%) | Total (%) |
|---|---|---|---|
| **CKD Stage 1 (GFR≧90)** | **1.03** | **0.97** | **1.00** |
| **CKD Stage 2 (90>GFR≧60)** | **3.02** | **2.07** | **2.53** |
| **CKD Stage 3 (60>GFR≧30)** | **8.61** | **7.96** | **8.27** |
| CKD Stage 3a (60>GFR≧45) | 7.48 | 6.62 | 7.03 |
| CKD Stage 3b (45>GFR≧30) | 1.13 | 1.34 | 1.24 |
| **CKD Stage 4 (30>GFR≧15)** | **0.13** | **0.26** | **0.20** |
| **CKD Stage 5 (15>GFR) excluding pts with dialysis or Tx** | **0.11** | **0.04** | **0.08** |
| CKD Stage 3-5 (60>GFR) | 8.85 | 8.26 | 8.55 |
| **Total** | **12.90** | **11.29** | **12.07** |

# Japan

## BMI and CKD

- 1978 local residents of the Kiyotake area of Japan.
- Body mass index (BMI) and prevalence of obesity in the residents with CKD were found to be higher than in those without CKD in both genders.
- Multivariate logistic method using age, BMI, antihypertensive and antidyslipidemic medicines, blood pressure, serum lipid and glucose as independent covariates, and found that BMI was a significant parameter independently correlated with CKD in both genders.

Nomura, I., Kato, J., and Kitamura, K. Association between body mass index and chronic kidney disease: a population-based, cross-sectional study of a Japanese community. Vasc.Health Risk Manag. 5(1), 315-320. 2009. (GENERIC)

# Japan

## Obesity and Proteinuria

- 16,031 men and 5,746 women aged from 20 to 39 years.
- No significant differences in eGFR between obese and nonobese groups.
- Hypertension, hyperglycemia, dyslipidemia, and hyperuricemia were independently associated with obesity.
- Body mass index (BMI) in both men and women increased with increase in number of risk factors ($P < 0.001$).
- Obesity and the risk factors were independently associated with proteinuria.

Matsushita, K., Yasuda, G., Shouda, M., and Umemura, S. Evaluation of renal function and proteinuria based on mass health examinations in young Japanese obese adults. Clin.Exp.Nephrol. 13(4), 316-324. 2009.

# CKD in Japan

## Kidney Early Evaluation Program (KEEP) define a high-risk population

- Japanese version of the US National Kidney Foundation's Kidney Early Evaluation Program (KEEP).
- High risk group: **1065** participants
- 26.9% had diabetes, 59.2% had hypertension, 16.9% had history of diabetes and hypertension together, and 30.6% had neither, but had family history of diabetes, hypertension, or kidney disease.
- CKD (stages 1-4) prevalence was 26.7%, CKD prevalence was 35.0% among diabetic participants, 34.8% among hypertensive participants, and 37.1% among participants with cardiovascular disease (CVD).
- CKD prevalence was high compared with the general Japanese population.

Takahashi, S., Okada, K., and Yanai, M. The Kidney Early Evaluation Program (KEEP) of Japan: results from the initial screening period. Kidney Int.Suppl (116), S17-S23. 2010.

# Japan

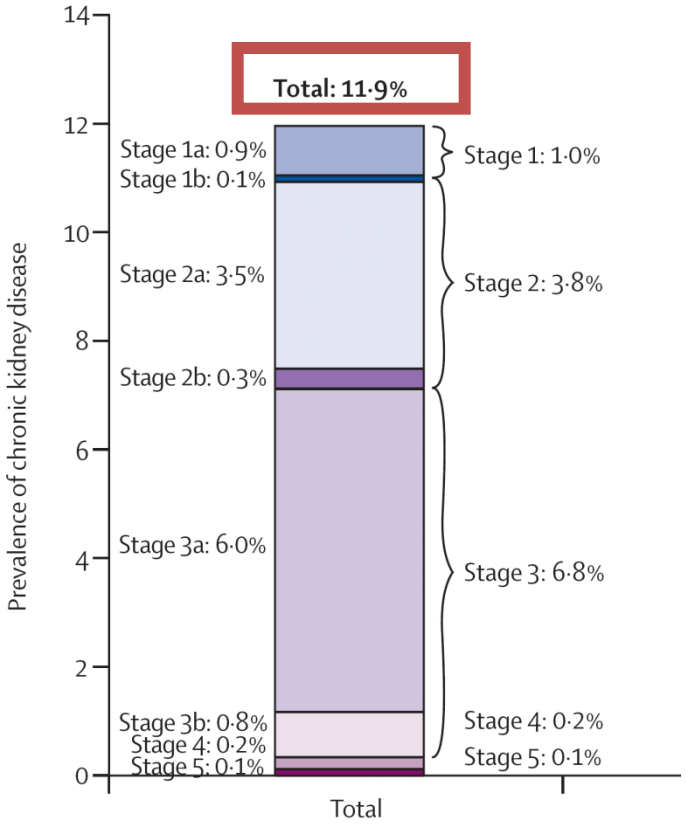
## Chronic kidney disease has a more powerful impact on peripheral arterial disease than metabolic syndrome in Japanese type 2 diabetic patients.

- Studied the prevalence of CKD and metabolic syndrome and impact on peripheral arterial disease (PAD) in type 2 diabetic patients.
- Japanese type 2 diabetic patients without hemodialysis (n = 1014). PAD was defined as ankle-brachial blood pressure index less than 0.9.
- The prevalence of CKD and metabolic syndrome was 47.1% and 39.6%, respectively. The prevalence of PAD was significantly higher in groups with CKD alone than those with metabolic syndrome alone.
- This study indicates that CKD has more powerful impact on PAD than metabolic syndrome in type 2 diabetic patients.

Metab Syndr Relat Disord. 7(4):323-6. 2009
Tsunoda K. et al..
Department of Clinical Laboratory Medicine, Wakayama Medical University, Japan.

# Taiwan CKD epidemiology

All-cause mortality attributable to chronic kidney disease: A prospective cohort study based on 462,293 adults in Taiwan




2: National prevalence of chronic kidney disease in adults in

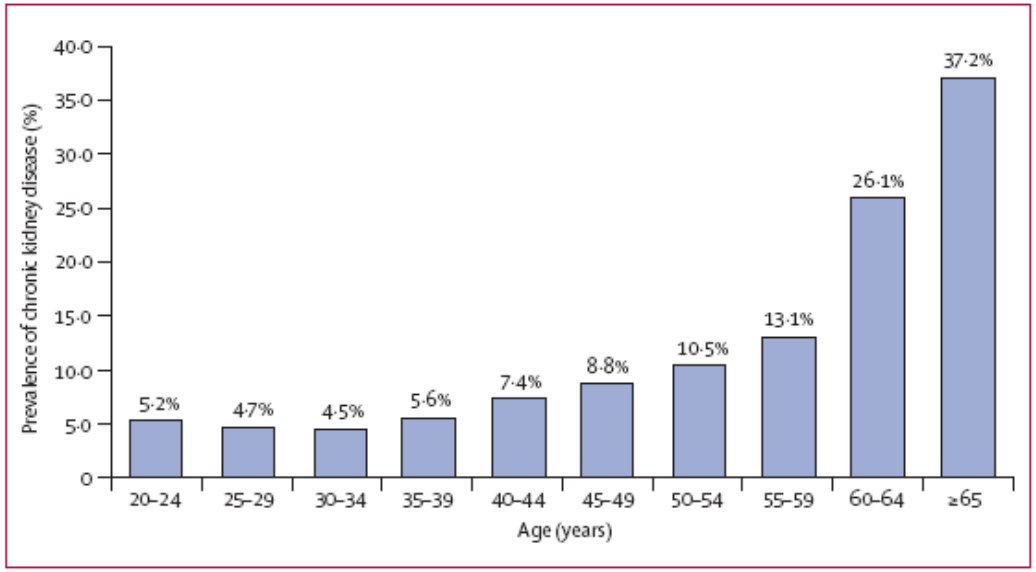



*Figure 3:* National prevalence of chronic kidney disease by 5-year age groups in adults in Taiwan

CKD prevalence 11.9% in Taiwan

Wen CP et al. Lancet 2008

# Summary of the High ESRD Burden in Taiwan

Causes of high prevalence and high incidence

- Increase of longevity and aged population
- Improvement in care of chronic diseases, but also increase of the chance of renal injury

⇨Diabetes and Aged are two major disease and group of dialysis patients

- National Health Insurance decreases the barrier for entering dialysis therapy

⇨Increasing dialysis patients after launching NHI

⇨ ⇨Increasing medical expenses and burdens

# Taiwan

## Hypertriglyceridemia: an independent risk factor of chronic kidney disease in Taiwanese adults.

- A community-based medical screening program in Chiayi County with 18,422 subjects
- The CKD was prevalent in **24.2%** of the middle-aged and elderly population. Old age and elevated levels of body mass index, systolic blood pressure, fasting plasma glucose, and cholesterol were associated with CKD.
- The adjusted odds ratios of CKD in participants with serum TG >==200 mg/dL was 1.901 and in participants with serum TG > 500 mg/dL it increased to 2.205.
- CONCLUSION: **Hypertriglyceridemia** is an independent risk factor for CKD in Taiwanese adults.

Am J Med Sci. 2009 Sep;338(3):185-9.
Lee PH, Chang HY, Tung CW, Hsu YC, Lei CC, Chang HH, Yang HF, Lu LC, Jong MC, Chen CY, Fang KY, Chao YS, Shih YH, Lin CL.
Department of Nephrology, Chang Gung Memorial Hospital, Pu-tzu City, Chiayi, Taiwan.

# Taiwan

## Determinants of peripheral arterial stiffness in patients with chronic kidney disease in southern Taiwan.

- To investigate the determinants of peripheral artery occlusive disease (PAOD) and arterial stiffness in patients with CKD in southern Taiwan.
- 169 patients with stage 3-5 CKD. Ankle-brachial index (ABI) and brachial-ankle pulse wave velocity were measured.
- Increased brachial-ankle pulse wave velocity was correlated with increased age, diabetes mellitus, increased systolic blood pressure, decreased pulse pressure and decreased eGFR.
- In addition to the traditional atherosclerotic risk factors, decreased eGFR was also correlated with PAOD and increased arterial stiffness in these patients.

Kaohsiung J Med Sci. 2009 Jul;25(7):366-73.
Chen JH, Chen SC, Liu WC, Su HM, Chen CY, Mai HC, Chou MC, Chang JM.
Department of Nursing, Kaohsiung Municipal Hsiao-Kang Hospital, Kaohsiung Medical University, Faculty of Renal Care, College of Medicine, Kaohsiung, Taiwan.

# Taiwan

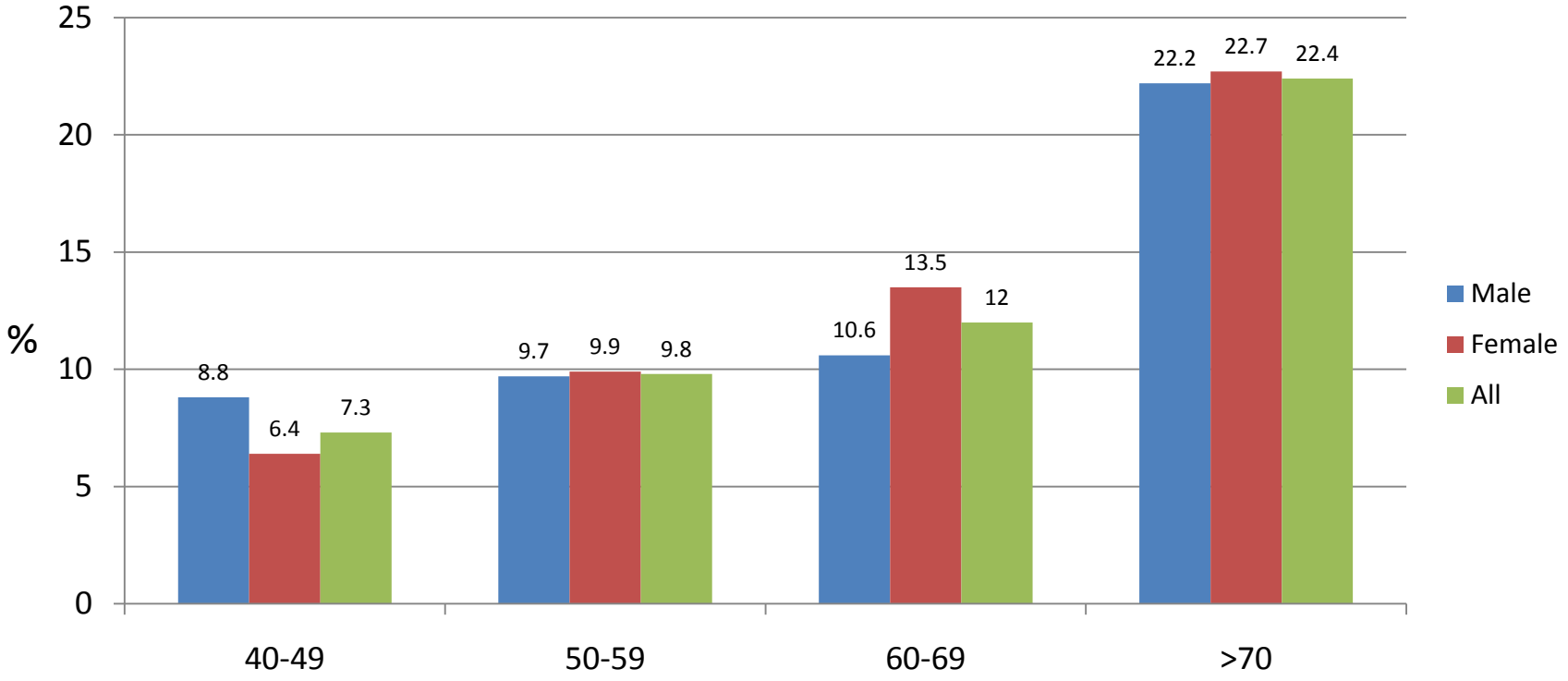
## Management of chronic kidney disease in Taiwan: room for quality improvement

- 200,000 individuals, 7,740 patients with CKD
- Only 54.8% had follow-up of renal function.
- Tests for anemia 34.5%, , calcium/phosphorus 5.2% and lipid profile 40.9%.
- Most hypertensive CKD patients have used antihypertensive agents, but only 58.1% of them received ACEIs or ARBs.
- Of CKD patients with diabetes, less than half had HbA1c measured, and only 49.7% received ACEIs/ARBs.
- CONCLUSIONS: Management of CKD patients is suboptimal, and lack of awareness is common.

J Nephrol. 22(5):654-61. 2009
**Kuo HW,** Tsai SS, Tiao MM, Liu YC, Yang CY.
Division of Nephrology, Department of Internal Medicine, Yuan's General Hospital, Kaohsiung, Taiwan.

# China

## Prevalence of chronic kidney disease in a middle and old-aged population of Beijing




N=2310

Clin Chim Acta. 2006 Apr;366(1-2):209-15.
Li ZY, Xu GB, Xia TA, Wang HY.
Department of Clinical Laboratory, Peking University First Hospital, Beijing, China.

# China

Comparison of the prevalence of chronic kidney disease among different ethnicities: Beijing CKD survey and American NHANES

- Screening for CKD in Beijing in 2006 was compared with data from the National Health and Nutrition Examination Survey (NHANES) between 1999-2006 (participants aged > or =20 years, 13 626 Chinese, 9006 whites, 3447 African Americans, 4626 Hispanics).
- The re-expressed abbreviated MDRD equation for Americans and its modified form for Chinese were used for eGFR.

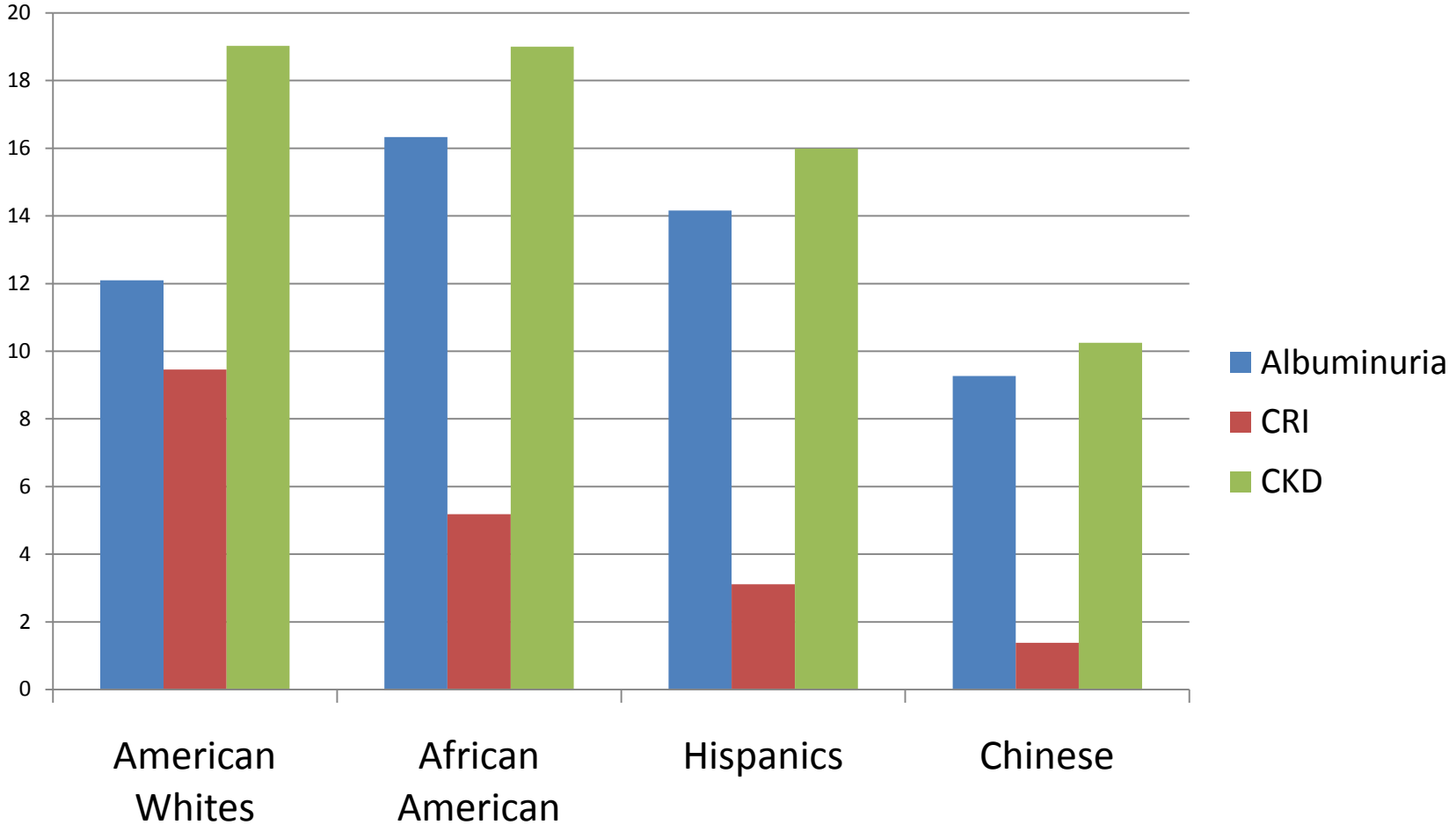
CONCLUSIONS:

- Native Chinese have a lower prevalence of albuminuria, CRI and CKD than American whites, African Americans and Hispanics.
- Chinese were more likely to have CRI when exposed to diabetes or hypertension.

Xu, R., Zhang, L., Zhang, P., Wang, F., Zuo, L., and Wang, H. Nephrol.Dial.Transplant. 24(4), 1220-1226. 2009.

# Chinese population
## lower prevalence of albuminuria, CRI and CKD

13 626 Chinese, 9006 whites, 3447 African Americans, 4626 Hispanics




Xu, R., Zhang, L., Zhang, P., Wang, F., Zuo, L., and Wang, H. Nephrol.Dial.Transplant. 24(4), 1220-1226. 2009.

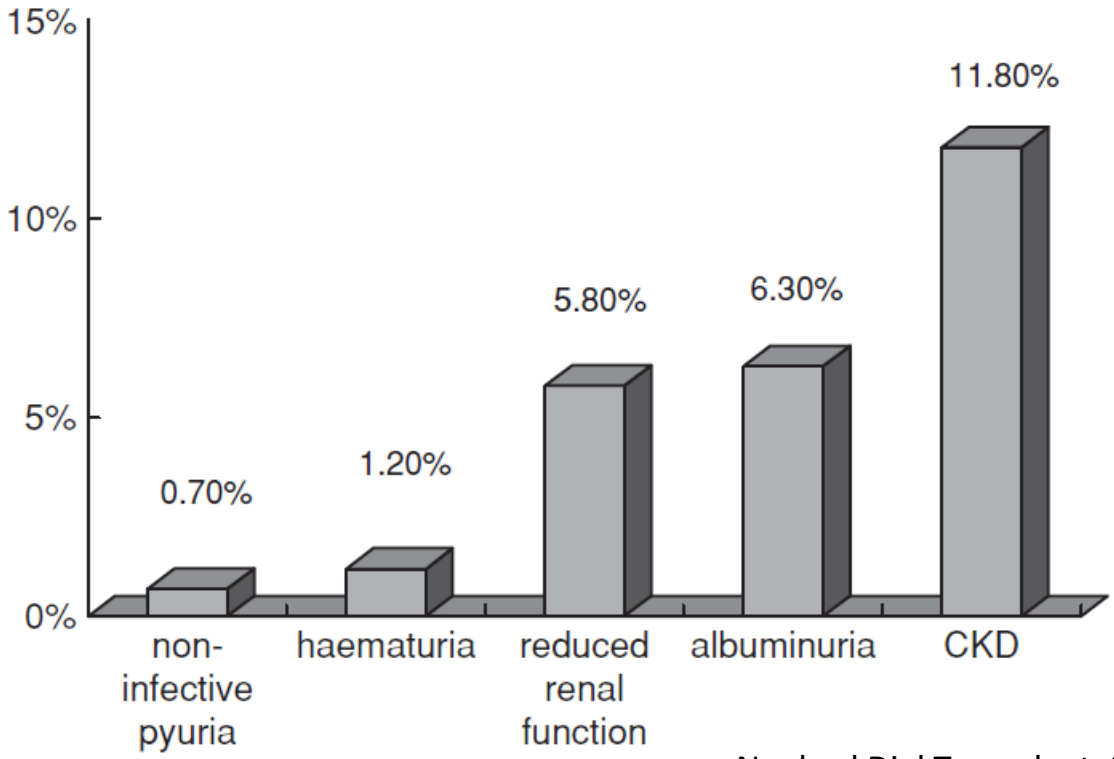
# China

## CKD in Shanghai 11.8%

- 2596 residents in Shanghai, China. 2554 were entered into this study. The First prevalence of CKD in the community population
- Simplified MDRD equation
- Albuminuria 6.3% and haematuria 1.2%, decreased kidney function 5.8%. 11.8% of subjects had CKD. The rate of awareness of CKD was 8.2%.
- Age, obesity, hypertension, diabetes, anaemia, hyperuri caemia and nephrolithiasis each contributed to the development of CKD.

Nephrol Dial Transplant. 24(7):2117-23. 2009
**Community-based study on CKD subjects and the associated risk factors.**
Chen N, Wang W, Huang Y, Shen P, Pei D, Yu H, Shi H, Zhang Q, Xu J, Lv Y, Fan Q.
Department of Nephrology, Ruijin Hospital, Shanghai Jiao Tong University, School of Medicine, Shanghai People's Republic of China.

# China
# CKD in Shanghai 11.8%




Nephrol Dial Transplant. 2009 Jul;24(7):2117-23.
**Community-based study on CKD subjects and the associated risk factors.**
Chen N, Wang W, Huang Y, Shen P, Pei D, Yu H, Shi H, Zhang Q, Xu J, Lv Y, Fan Q.

# Shanghai

## Shanghai Diabetic Complications Study (SHDCS)

- 3714 adults in Shanghai.
- microalbuminuria 22.8%, , macroalbuminuria 3.4% and CKD 29.6%, in subjects with diabetes.
- Diabetes and cardiovascular disease (CVD) both increased the risk for albuminuria. Although the worsening trends of eGFR are similar in diabetes and IGR subjects, IGR was not a significant risk factor for albuminuria and renal insufficiency.
- CONCLUSION: Screening for albuminuria and eGFR is highly recommended for older patients with diabetes, hypertension and CVD to prevent end-stage kidney disease.

Nephrol Dial Transplant. 2009 Dec;24(12):3724-31.
Jia W, Gao X, Pang C, Hou X, Bao Y, Liu W, Wang W, Zou Y, Gu H, Xiang K.
Department of Endocrinology and Metabolism, Shanghai Clinical Center of Diabetes, Shanghai Jiaotong University Affiliated Sixth People's Hospital, Shanghai Diabetes Institute, Shanghai Key Laboratory of Diabetes Mellitus,

# China

## Improvement of awareness, treatment and control of hypertension among chronic kidney disease patients in China from 1999 to 2005.

- Two nationwide surveys were conducted in China in 1999-2000 and 2004-2005 among, respectively.
- 1328 and 1244 adult, non-dialysis, hypertensive CKD patients, to assess the status of hypertension awareness, treatment and control.
- Compared with the data from 1999-2000, the data from 2004-2005 showed increased awareness (87.2 vs. 75.7%, P<0.001), treatment (85.9 vs. 80.4%, P=0.001) and control (30.0 vs. 21.1%, P<0.001, by the general threshold of BP<140/90 mm Hg; 7.7 vs. 5.9%, P=0.075, by an optimal threshold of BP<130/80 mm Hg) of hypertension.

Wang, Y. and Wang, H. Y. Hypertens.Res. 32(6), 444-449. 2009.

# Korea

The prevalence of chronic kidney disease (CKD) and the associated factors to CKD in urban Korea: a population-based cross-sectional epidemiologic study

- The 2,356 subjects 35 yr of age or older.
- MDRD Study equation.
- The overall prevalence of CKD was 13.7%.
- The prevalences of CKD according to stage were 2.0% stage 1, 6.7% stage 2, 4.8% stage 3, 0.2% stage 4, and 0.0% stage 5.
- The prevalences of microalbuminuria and macroalbuminuria were 8.6% and 1.6%, respectively. The prevalence of eGFR less than 60 mL/min/1.73 m(2) was 5.0%.
- Age, body mass index (BMI), hypertension, diabetes mellitus, systolic blood pressure (SBP), diastolic blood pressure (DBP), and fasting blood glucose were independent factors related to the presence of CKD.

Kim, S., Lim, C. S., Han, D. C., Kim, G. S., Chin, H. J., Kim, S. J., Cho, W. Y., Kim, Y. H., and Kim, Y. S. J.Korean Med.Sci. 24 Suppl, S11-S21. 2009.

# Korea

Chronic kidney disease and metabolic syndrome in a general Korean population: the Third Korea National Health and Nutrition Examination Survey (KNHANES III) Study

- The prevalence of CKD was 6.8%.
- The age-adjusted prevalence of CKD among those with metabolic syndrome was 9.0% whereas those without metabolic syndrome was 5.6%.
- After adjusting for age and confounders, people with metabolic syndrome had a 1.77 times greater risk of CKD than those without metabolic syndrome .
- Metabolic syndrome showed significant association with CKD

Jang, S. Y., Kim, I. H., Ju, E. Y., Ahn, S. J., Kim, D. K., and Lee, S. W. J.Public Health . 8-1-2010.

# Korea

## Obesity and metabolic syndrome-related CKD in nondiabetic, nonhypertensive adults.

- Korea National Health and Nutrition Examination Survey III data from 3771 nondiabetic, nonhypertensive Koreans were analyzed.
- The prevalence of metabolic syndrome (MS) and CKD was **13.4%** and **3.2%**, respectively.
- The association between MS and CKD was significant in obese (OR, 2.91), but not nonobese (OR, 1.38), subjects.
- In obese subjects, impaired fasting glucose (OR, 2.47) and high triglyceride levels (OR, 2.42) were risk factors for CKD.
- Findings suggest that even in nondiabetic, nonhypertensive Korean adults, MS is associated with chronic kidney disease CKD.

Yoon YS, Park HS, Yun KE, Kim SB. Metabolism. 58(12):1737-42. 2009

# Korea

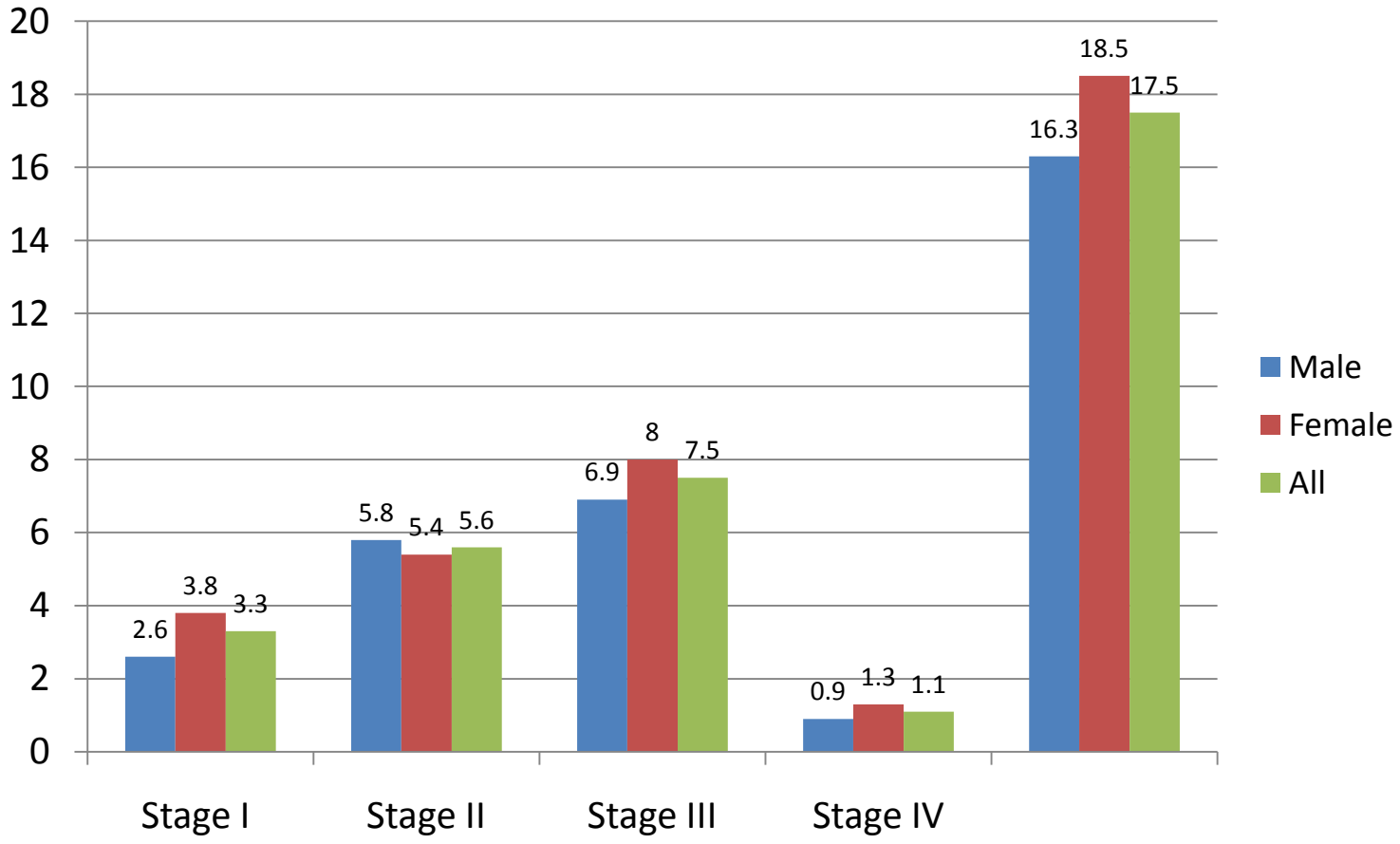
## Time-dependent association between metabolic syndrome and risk of CKD without hypertension or diabetes

- 10,685 healthy men. During 40,616.8 person-years of follow-up, 291 incident cases of CKD developed; 787 patients (7.4%) had metabolic syndrome at baseline and 1,444 (14.4%) developed incident metabolic syndrome during follow-up.
- Metabolic syndrome at baseline was associated with a significantly increased risk of CKD (HR, 1.99) and metabolic syndrome over time as a time-dependent variable also predicted the development of CKD (HR, 1.83).
- Metabolic syndrome is an independent risk factor for the development of CKD in Korean men without hypertension or diabetes.
- Both increased triglyceride and low HDL levels among metabolic syndrome traits were associated with significantly increased risk of CKD.

Ryu, S., Chang, Y., Woo, H. Y., Lee, K. B., Kim, S. G., Kim, D. I., Kim, W. S., Suh, B. S., Jeong, C., and Yoon, K. Am.J.Kidney Dis. 53(1), 59-69. 2009.

# Thailand

Thai Screening and Early
Evaluation of Kidney Disease (SEEK) study

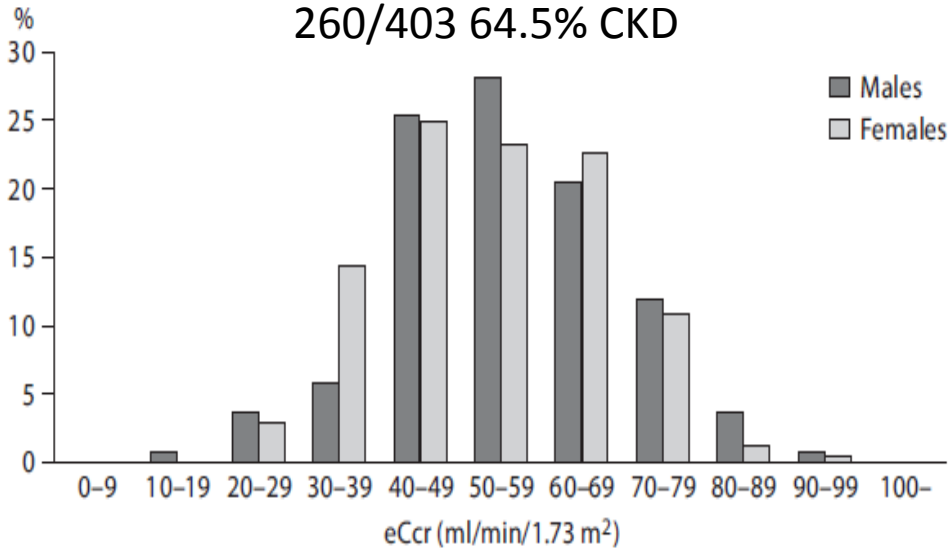



Atiporn Ingsathit
Nephrol Dial Transplant (2009)

# Vietnam

**Impact and Perspective on Chronic Kidney Disease in an Asian Developing Country: A Large-Scale Survey in North Vietnam**

N=8,505
260/403 64.5% CKD



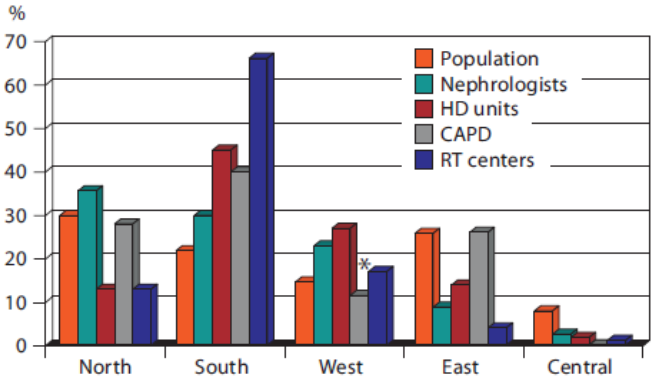

**Abnormal urinary findings-> proteinuria, hematuira, glocosuria ->kidney ultrasound, sCr for eCCr**

- 3.1% of subjects as CKD (stages 3–5) with positive findings in urine test.
- Hypertension and malnutrition were independent risk factors for CKD in this population

Jun Ito
International Center for Medical Research and Treatment, Kobe University School of Medicine
Nephron Clin Pract 2008;109:c25–c32

# India

- The burden of chronic kidney disease (CKD) in India cannot be assessed accurately.
- The approximate prevalence of CKD is 800 per million population (pmp), and the incidence of end-stage renal disease (ESRD) is 150-200 pmp.
- The most common cause of CKD in population-based studies is diabetic nephropathy.




Nephron Clin Pract. 2009;111(3):c197-203
**Chronic kidney disease in India: challenges and solutions.**
Agarwal SK, Srivastava RK.
Department of Nephrology, All India Institute of Medical Sciences, New Delhi, India

# Australia

**Screening for chronic kidney disease in Australia: a pilot study in the community and workplace (1)**

- The Kidney Evaluation for You (KEY) program was conducted in Australia to screen for CKD.
- Targeting people at high risk (diabetes, hypertension, a first-degree relative with kidney failure, or age >50 years), promoting changes in risk-factor management, and explore participant CKD awareness.
- KEY offered free cardiovascular and kidney checks (eGFR, HbA1C, cholesterol, hemoglobin, albuminuria), lifestyle assessment, and exit interviews.
- Participants were telephoned at 3 months to ascertain whether KEY advice had been followed.

*Screen and Act*

Kidney Int Suppl. 2010 Mar;(116):S9-16.
Mathew TH, Kidney Health Australia, Adelaide, South Australia, Australia

# Australia

**Screening for chronic kidney disease in Australia: a pilot study in the community and workplace (2)**

- Of 402 high-risk individuals 20.4% had CKD. Of these, 69% had hypertension, 30% diabetes, and 40% elevated total cholesterol. All participants with CKD stage 3b or higher were aged >61 years.
- 58% of participants were referred to their primary care providers for further action; of these, 82% saw their doctors in the next 3 months and 94% discussed KEY results. Follow-up telephone contact was successful for 82% of participants. A change in management occurred for 67%.
- Early detection of CKD and selected referral of participants was largely successful.

*Screen and Act*

Kidney Int Suppl. 2010 Mar;(116):S9-16.
Mathew TH, Kidney Health Australia, Adelaide, South Australia, Australia

# Summary

- ESRD and CKD incidence and prevalence indicating high heterogeneity in epidemiology.
- Glomerulonephritis is decreasing in major areas of Asia.
- Diabetes and metabolic syndrome have become important causes and targets for CKD prevention and treatment in Asia.
- CKD program with education, early detection and early referral for treatment should be important.

# Diseases of specific Asian Pacific interest

## Industrial poisons

Lead
Cadmium
Melamine
Insecticides

## Plant toxins

Aristolochic acid
Djenkel beans (djenkolism)
Animal toxins
Snake bite
Wasp sting
Bee sting

## Tropical infections

Malaria
Leptospirosis
Typhus
Dengue
Hantavirus

## Regional diseases

Hypokalaemic periodic paralysis (Thailand)
Renal tubular acidosis (Thailand, PNG)
Tubulointerstitial nephritis (Sri Lanka)

## Increased disease of metabolic origin

Metabolic syndrome (all Asia)
Renal stones (heat, dehydration)
Diabetes (Nauru, Australia Aborigine)

By Gavin J Becker
*J Korean Med Sci 2009; 24 (Suppl 1): S3-6*

# Asian Leadership in Chronic Kidney Disease

**"Asian Pacific countries include those with the highest incidence of renal failure in the world, the richest and poorest economies and unparalleled diversity of economy, culture and geography. From this come many challenges, but also a strong basis for the introduction of strategies to combat renal diseases."**

Gavin J Becker

*J Korean Med Sci 2009; 24 (Suppl 1): S3-6*

# Asian Leadership in Chronic Kidney Disease

**"Asian can lead nephrology in the 21st century. It is now up to all of us to contribute to this collaborative effect. With a rapidly developing scientific community, Asia needs to accept the challenge of becoming a global leader in nephrology in the near future"**

Gavin J Becker

*J Korean Med Sci 2009; 24 (Suppl 1): S3-6*

# AfCKDi
# Work Group 3

*Chair*

Philip K.T. LI, Hong Kong

- Togtokh ARIUNAA, Mongolia
- Jimmy Teo BOON, Singapore
- Nan CHEN, China
- Anutra CHITTINANDANA, Thailand
- Kai Ming CHOW, Hong Kong-Secretary
- Lynn GOMEZ, Philippines
- David HARRIS, Australia
- Lai Seong HOOI, Malaysia
- Vivek JHA, India
- Suhnggwon KIM, Korea
- Sanjib KUMAR, Nepal
- Seiichi MATSUO, Japan
- Enyu Imai, Japan
- Rowan WALKER, Australia
- Haiyan WANG, China
- Chih Wei YANG, Taiwan
- Seong Lai Hooi, Malaysia