Diabetes in Asian Americans

www.screenat23.org

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National Council of Asian Pacific Islander Physicians
www.ncapip.org

- **American Diabetes Association**

- **Joslin Diabetes Center**

- **National Council of Asian Pacific Islander Physicians**

- **Asian American Native Hawai'ian Pacific Islanders Diabetes Coalition**

U.S. Asian-American Population, 2011

18,205,898
TOTAL U.S. ASIAN AMERICANS

THEY MAKE UP 5.8% OF THE TOTAL U.S. POPULATION.

SIX GROUPS MAKE UP AT LEAST 83% OF THE TOTAL ASIAN-AMERICAN POPULATION

Group	Population
Chinese	4,010,114
Filipino	3,416,840
Indian	3,183,063
Vietnamese	1,737,433
Korean	1,706,822
Japanese	1,304,286

A SNAPSHOT

DIABETES
IN THE UNITED STATES

CDC

DIABETES

29.1 MILLION

29.1 million people have diabetes

That's about 1 out of every 11 people

1 OUT OF 4 do not know they have diabetes

10 Leading Causes of Death in 2009

Caucasians

1. CVD
2. Cancer
3. Respiratory disease
4. Cerebrovascular disease
5. Accidents
6. *Alzheimer's*
7. **Diabetes**
8. Influenza/pneumonia
9. Kidney disease
10. *Suicide*

Asian/Pacific Islander

1. CVD
2. Cancer
3. Cerebrovascular disease
4. Accidents
5. **Diabetes**
6. Influenza/pneumonia
7. Respiratory disease
8. *Kidney disease*
9. Alzheimer's disease
10. Suicide

National Vital Statistics Reports, 2011;60;98-103

Diabetes Prevalence in the U.S.

	Total (%)	Diagnosed (%)	Undiagnosed (%)	Prediabetes (%)	Mean BMI (kg/m²)
Overall	14.3	9.1	5.2	38.0	28.7
White	11.3	7.5	3.8	38.2	28.4
Asian	20.6	10.0	10.6	32.2	24.6
Black	21.8	14.9	7.0	39.6	30.8
Hispanic	22.6	12.5	10.1	36.8	29.7

Menke A, et al. Prevalence of and Trends in Diabetes Among Adults in the United States, 1988-2012. *JAMA*. 2015; 314(10):1021-1029.

Prevalence of T2DM 2,123,548 Adult Members of Northern California Kaiser Permanente Hospitals in 2010

Race /Ethnicity	Prevalence (%)
Pacific Islander	**18.3**
Filipino	**16.1**
South Asian	**15.9**
Latino	14.0
African American	13.7
Native American	13.4
Southeast Asian	10.5
Japanese	10.3
Vietnamese	9.9
Korean	9.9
Chinese	8.2
White	7.3

Karter AJ et al; D*iabetes Care 2013: 36;574-9*

Standardized Diabetes Incidence (per 1,000 person-years) in 16,283 adults diagnosed with diabetes in 2010, KP Northern California

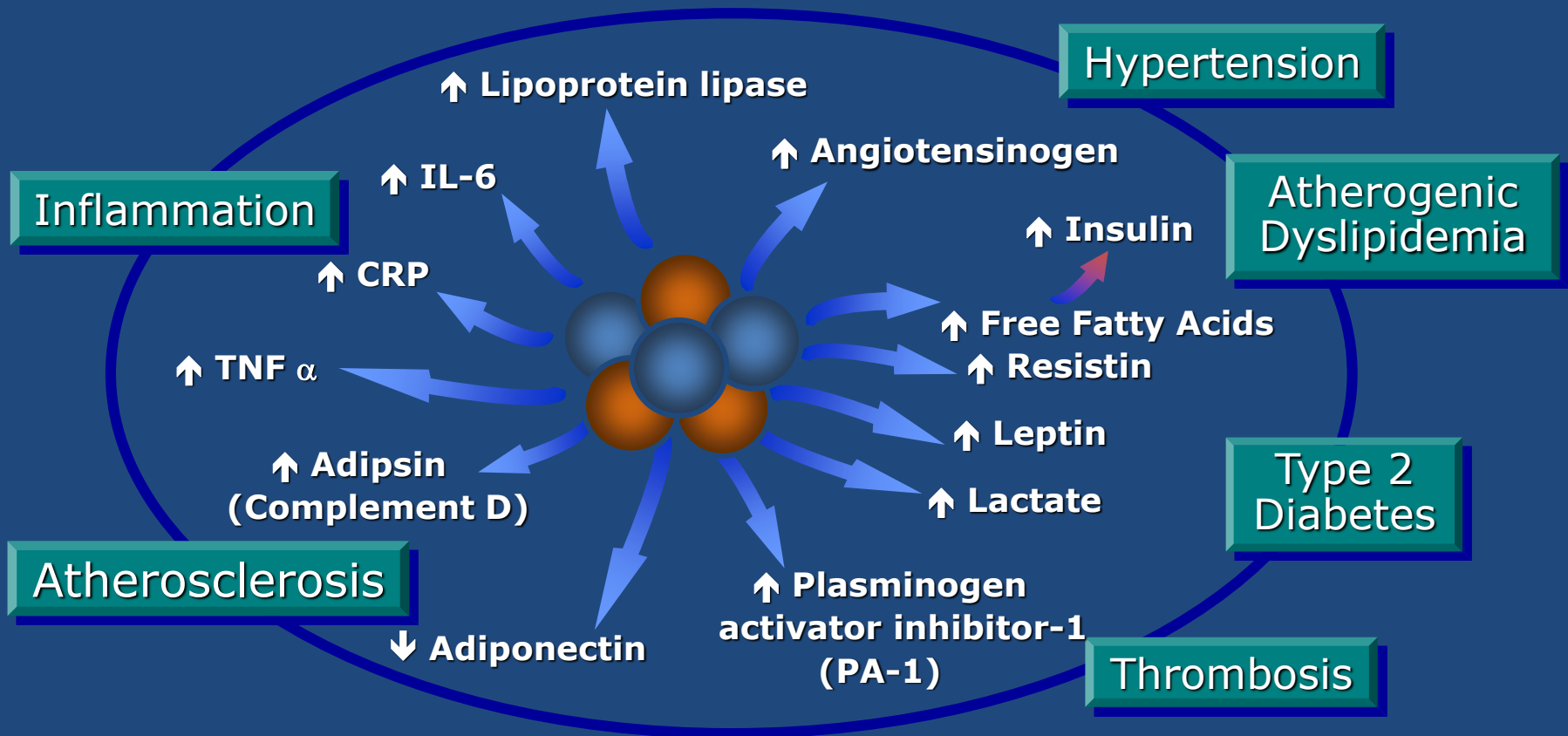Karter AJ et al. *Diabetes Care* 2013:36;574-9
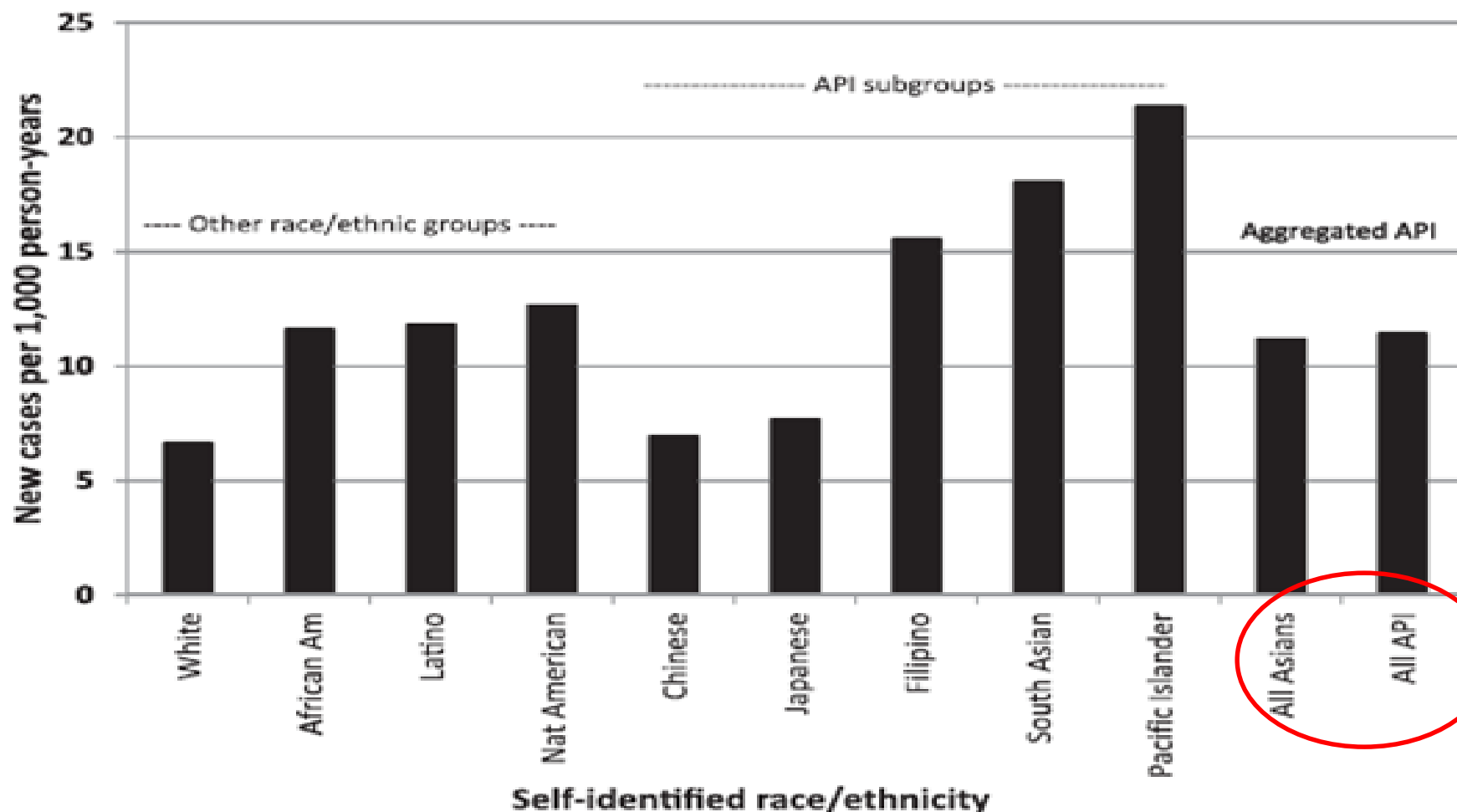
BMI of 1,704,363 Adult Members by Race & Diabetes Status
KP Northern California, 2010
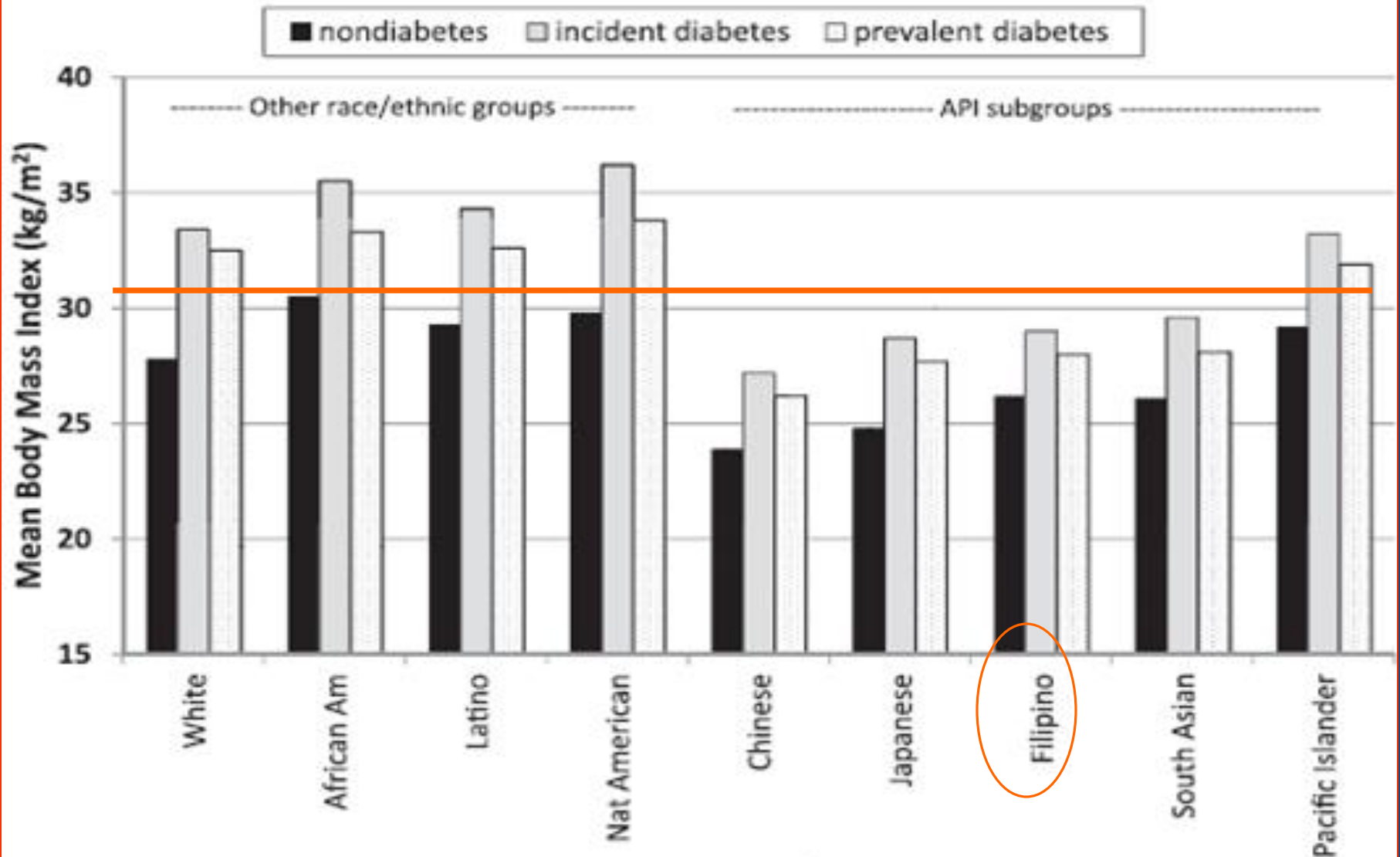
Countries with Highest Estimated Diabetes Cases – WHO 2000 and 2030

	2000	millions		**2030**	millions
1.	India	32	1.	India	79
2.	China	21	2.	China	42
3.	US	18	3.	US	30
4.	Indonesia	8	4.	Indonesia	21
5.	Japan	7	5.	Pakistan	14
6.	Pakistan	5	6.	Brazil	11
7.	Russian Fed	5	7.	Bangladesh	11
8.	Brazil	5	8.	Japan	9
9.	Italy	4	9.	Philippines	8
10.	Bangladesh	3	10.	Egypt	7

Adipose Tissue Is an Endocrine Organ: Function in Health and Disease

↑ Lipoprotein lipase

↑ IL-6

↑ CRP

↑ TNF α

↑ Adipsin (Complement D)

↓ Adiponectin

↑ Angiotensinogen

↑ Insulin

↑ Free Fatty Acids

↑ Resistin

↑ Leptin

↑ Lactate

↑ Plasminogen activator inhibitor-1 (PA-1)

Inflammation

Atherosclerosis

Hypertension

Atherogenic Dyslipidemia

Type 2 Diabetes

Thrombosis

CRP = C-reactive protein; IL-6 = interleukin-6; TNFα = tumor necrosis factor-alpha

Visceral Adipose Tissue by Computed Tomography
African American vs Filipina women

SUBJECT CODE: HASAAW092
AGE: 62
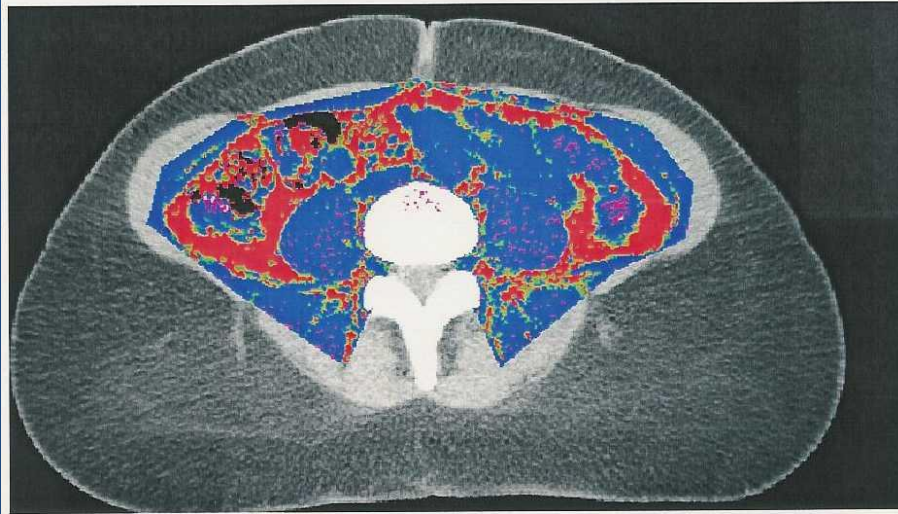SEX: F
WEIGHT (LBS): 160
SUBJECT INITIALS: PC
DATE OF EXAM: 02/06/2002
VISCERAL FAT (CM3): 25.4
SUBCUTANEOUS FAT (CM3): 221.4
RATIO VF/SF: 0.13

African-American

SUBJECT CODE: FIRBOO215
AGE: 69
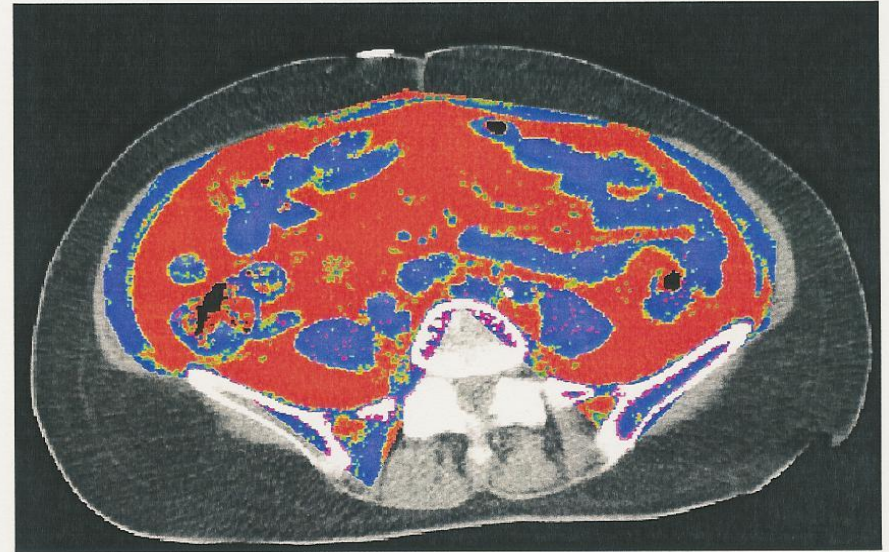SEX: F
WEIGHT (LBS): 115
SUBJECT INITIALS: RM
DATE OF EXAM: 12/11/2001
VISCERAL FAT (CM3): 84
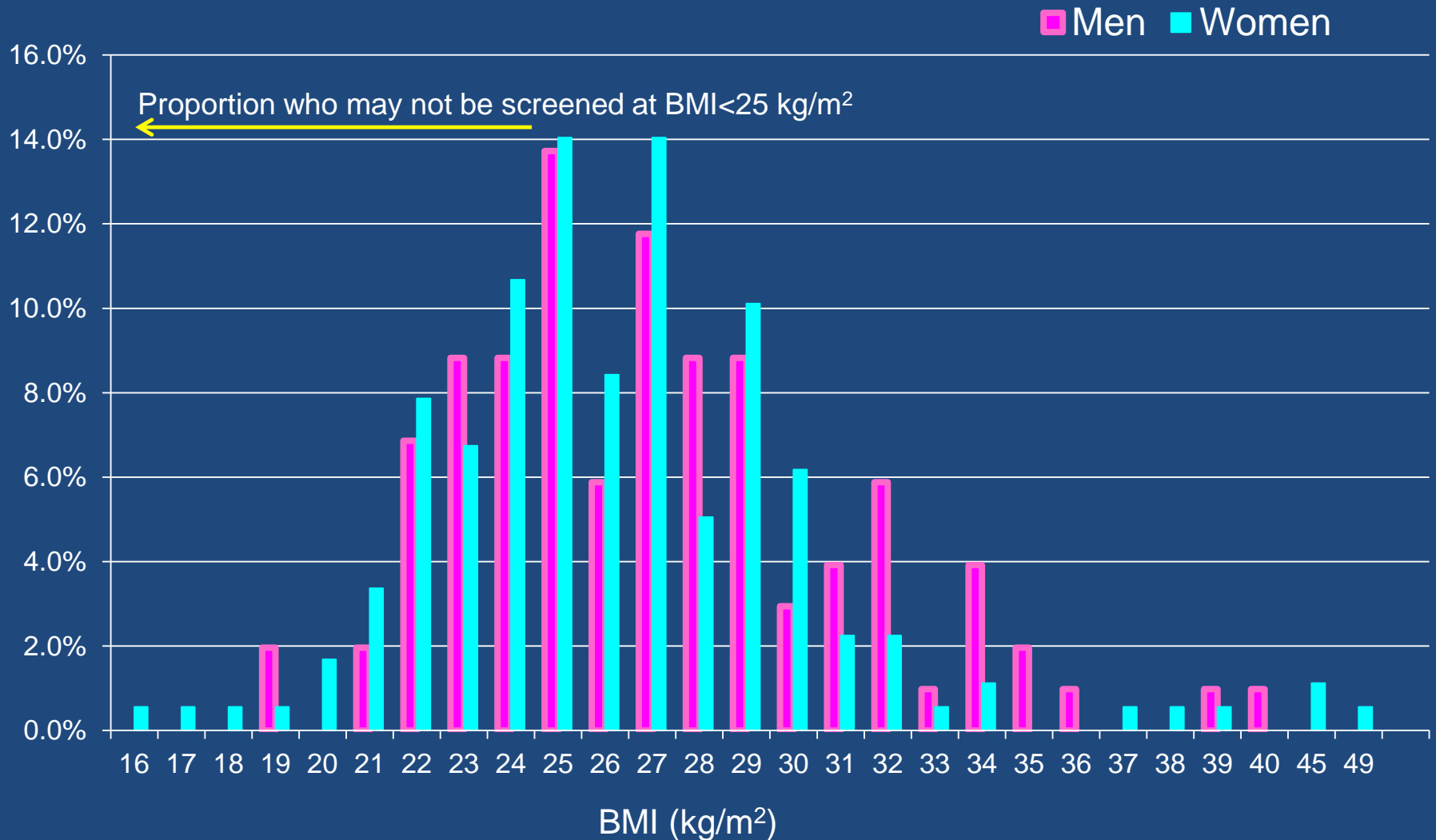SUBCUTANEOUS FAT (CM3): 125
RATIO VF/SF: 67

Filipina

Weight: 160 lbs, Height: 5'7"
BMI=25 kg/m^2
VAT: 25.4cm^3

Weight: 115 lbs, Height: 5'4"
BMI=20 kg/m^2
VAT: 84.0 cm^3

Percent distribution of Asian-Americans with newly diagnosed Type 2 Diabetes by Body Mass Index

Proportion who may not be screened at BMI<25 kg/m^2

BMI (kg/m^2)

37% of women and 21% of men with T2DM had BMI<25 kg/m^2

T2DM by BMI≥25 kg/m² cut-point

BMI (kg/m²)	T2DM	No diabetes	Total
>= 25	179	730	
< 25	**102**	652	
Total	**281**	1382	1663

- **36%** (n=102) of AAs with T2DM might be undiagnosed if screening is limited to BMI >=25 kg/m²

Sensitivity: 179/281 = **64%**   Specificity: 652/1382= **47%**
Youden's index: (64% + 47%) – 1 = **11%**
Misclassification rate: 102 / 281 + 730 / 1382 = **89%**

Sensitivity, Specificity, PPV and AUC among Asian-American adults, ages >=45 years

BMI (kg/m^2)	Diabetes (%)	Sensitivity (%)	Specificity (%)	Misclassi-fication Rate (%)
>=23	238 (14.3)	84.7	28.8	0.87
>=24	208 (12.5)	74.0	40.7	0.85
>=25	179 (10.8)	63.7	52.8	0.84
>=26	145 (8.7)	51.6	65.3	0.83
>=27	122 (7.3)	43.4	73.6	0.83
>=27.5	102 (6.1)	36.3	77,8	0.86

Sensitivity at Selected BMI Cut-points
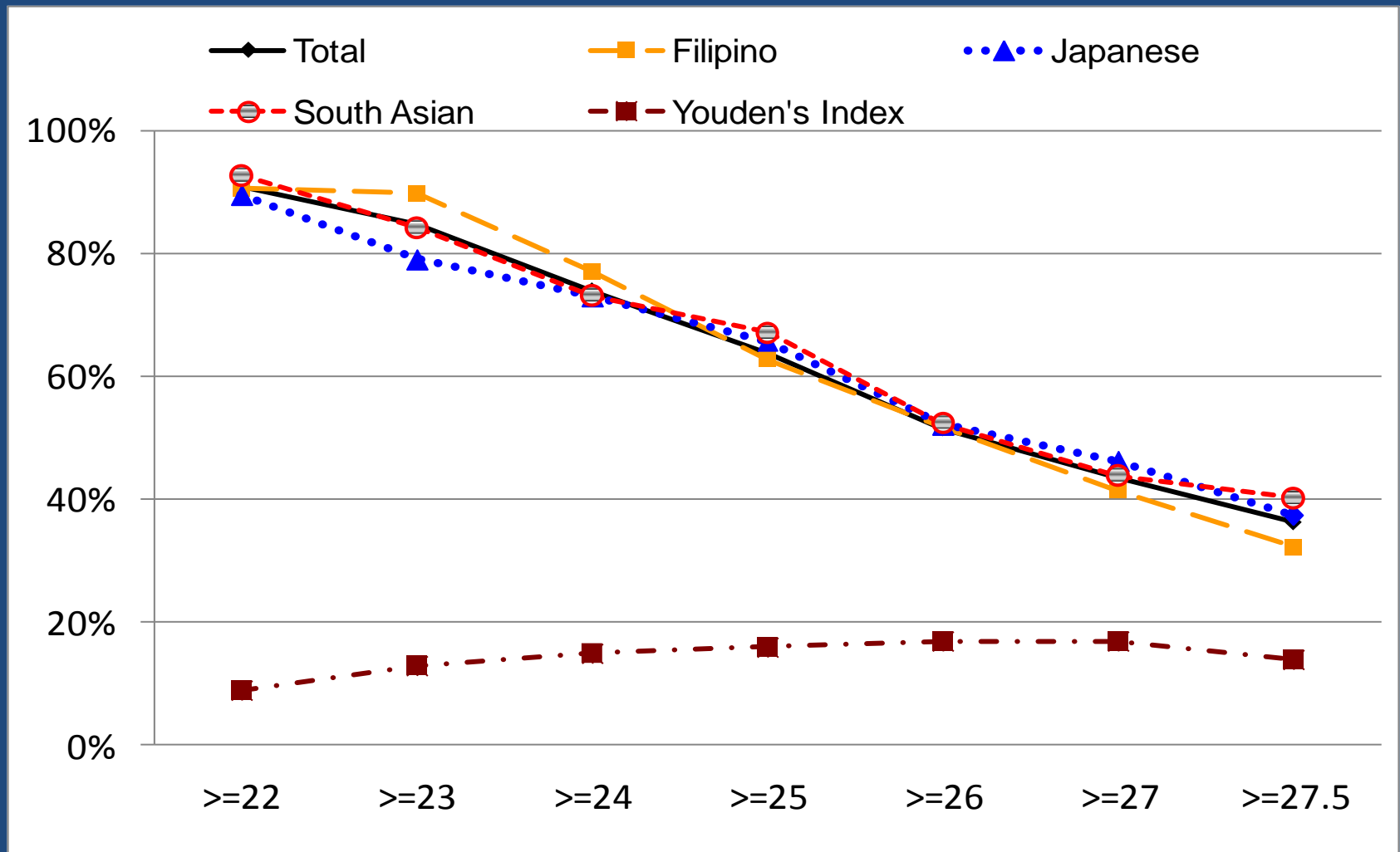
Diabetes screening at a lower cutpoint of BMI>=23 kg/m2 should be considered and will enable early diagnosis and management

"Best of Care" at 2015 ADA in Boston
One of 9 most noteworthy articles published in Diabetes Care in 2014

Optimum BMI Cut Points to Screen Asian Americans for Type 2 Diabetes

Maria Rosario G. Araneta,[1]
Alka M. Kanaya,[2] William C. Hsu,[3]
Healani K. Chang,[4] Andrew Grandinetti,[4]
Edward J. Boyko,[5,6,7] Tomoshige Hayashi,[8]
Steven E. Kahn,[6,7] Donna L. Leonetti,[9]
Marguerite J. McNeely,[7] Yukiko Onishi,[10]
Kyoko K. Sato,[8] and Wilfred Y. Fujimoto[7]

OBJECTIVE

Asian Americans manifest type 2 diabetes at low BMI levels but may not receive diagnostic testing for diabetes if the currently recommended BMI screening point of ≥25 kg/m² is followed. We aimed to ascertain an appropriate lower cut point among Asian-American adults without a prior diabetes diagnosis.

BMI Cut Points to Identify At-Risk Asian Americans for Type 2 Diabetes Screening

William C. Hsu,[1]
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Alka M. Kanaya,[3] Jane L. Chiang,[4]
and Wilfred Fujimoto[5]

ASIAN AMERICAN POPULATION

According to the U.S. Census Bureau, an Asian is a person with origins from the Far East (China, Japan, Korea, and Mongolia), Southeast Asia (Cambodia, Malaysia, the Philippine Islands, Thailand, Vietnam, Indonesia, Singapore, Laos, etc.), or the Indian subcontinent (India, Pakistan, Bangladesh, Bhutan, Sri Lanka, and Nepal); each region has several ethnicities, each with a unique culture, language, and history. In 2011, 18.2 million U.S. residents self-identified as Asian American, with more than two-thirds foreign-born (1). In 2012, Asian Americans were the nation's fastest-growing racial or ethnic group, with a growth rate over four times that of the total U.S. population. International migration has contributed >60% of the growth rate in this population (1). Among Asian Americans, the Chinese population was the largest (4.0 million), followed by Filipinos (3.4 million), Asian Indians (3.2 million), Vietnamese (1.9 million), Koreans (1.7 million), and Japanese (1.3 million). Nearly three-fourths of all Asian Americans live in 10 states—California, New York, Texas, New Jersey, Hawaii, Illinois, Washington, Florida, Virginia, and Pennsylvania (1). By 2060, the Asian American population is projected to more than double to 34.4 million, with its share of the U.S. population climbing from 5.1 to 8.2% in the same period (2).

Conclusions

- Current guidelines to screen adults with BMI $\geq$25 kg/m^2 fail to identify 1 out of 3 Asian-Americans with newly diagnosed type 2 diabetes.

- BMI Cut-Point of $\geq$23 kg/m^2 Most Practical for Asian-Americans.

- Limiting screening to HbA1c and fasting glucose measures may fail to identify half of Asian-Americans with diabetes.

Criteria for Diabetes Diagnosis

A1C ≥6.5%*
Perform in lab using NGSP-certified method and standardized to DCCT assay

OR

FPG ≥126 mg/dL (7.0 mmol/L)*
Fasting defined as no caloric intake for ≥8 hrs

OR

2-hr PG ≥200 mg/dL (11.1 mmol/L) during OGTT (75-g)*
Performed as described by the WHO, using a glucose load containing the equivalent of 75g anhydrous glucose dissolved in water

OR

Random PG ≥200 mg/dL (11.1 mmol/L)
In persons with symptoms of hyperglycemia or hyperglycemic crisis

- Unless clinical diagnosis is clear, same test to be repeated immediately using a new blood sample for confirmation
- 2 discordant results? Result above diagnostic cutpoint should be repeated

*In absence of unequivocal hyperglycemia, result to be confirmed by repeat testing
FPG=fasting plasma glucose; OGTT=oral glucose tolerance test; PG=plasma glucose

Testing for Type 2 Diabetes & Prediabetes in Asymptomatic Individuals

- Type 2 diabetes testing
  - All adults who are overweight or obese (BMI ≥25 or ≥23 in Asian Americans) who have ≥1 diabetes risk factor
  - Test starting at age 45, especially if overweight or obese
  - If normal results: repeat testing in ≥3-yr intervals
- Prediabetes testing
  - A1C, FPG, or 2-h PG after 75-g OGTT
  - Identify & treat (if appropriate) other CVD risk factors
  - Consider testing in children and adolescents who are overweight/obese and have ≥2 diabetes risk factors

Diabetes Risk Factors
- Physical inactivity
- First-degree relative with diabetes
- High-risk race/ethnicity
- Women who delivered a baby >9 lb or were diagnosed with GDM
- HDL-C <35 mg/dL ± TG >250 mg/dL
- Hypertension (≥140/90 or on therapy)
- A1C ≥5.7%, IGT, or IFG on previous testing
- Conditions associated with insulin resistance: severe obesity, acanthosis nigricans, PCOS
- CVD history