Innovations in diabetes screening and interventions for Asian Americans, Native Hawaiians, and Pacific Islanders

May 4, 2016

The findings and conclusions in this webinar are those of the presenters and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Introduction

Judith McDivitt, Ph.D.
Director
National Diabetes Education Program
Division of Diabetes Translation
Centers for Disease Control and Prevention
Continuing Education

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  – Pass the posttest with 60% at www.cdc.gov/TCEOnline

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Webinar Objectives

• Describe the American Diabetes Association’s (ADA) 2015 diabetes screening guidelines for Asian Americans and the science behind them
• Explain the “Screen at 23” campaign to increase awareness and action among health care providers who treat Asian American, Native Hawaiian, and Pacific Islander (AANHPI) individuals, health authorities, and the general public
• Describe culturally-appropriate tools and strategies for preventing and managing diabetes in AANHPI populations
Today’s Presenters

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Dept. of Family Medicine and Public Health
University of California San Diego

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President and CEO
National Council of Asian Pacific Islander Physicians

Angela Sun, PhD, MPH
Executive Director, Chinese Community Health Resource Center
Founder/President, Asian Alliance For Health

Nia Aitaoto, PhD, MPH, MS
Evaluator, AAPCHO Vulnerable Populations Program
Assistant Professor, College of Medicine, University of Arkansas for Medical Sciences
Co-Director, Center for Pacific Islander Health, UAMS
THE “SKINNY” ON THE AMERICAN DIABETES ASSOCIATION’S NEW SCREENING GUIDELINES FOR ASIAN AMERICANS
Testing for Type 2 Diabetes in Asymptomatic Individuals, ADA 2015 Guidelines

- Type 2 diabetes testing
  - All adults who are overweight or obese (BMI $\geq 25$ or $\geq 23$ in Asian Americans) who have $\geq 1$ diabetes risk factor
  - Test starting at age 45, especially if overweight or obese
  - If normal results: repeat testing in $\leq 3$-yr intervals

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 $\pm$ TG $>250$ mg/dL
- Hypertension ($\geq 140/90$ or on therapy)
- A1C $\geq 5.7\%$, IGT, or IFG on previous testing
- Conditions associated with insulin resistance: severe obesity, acanthosis nigricans, PCOS
- CVD history
Prevalence of Type 2 Diabetes Among 2,123,548 Adult Members of Northern California Kaiser Permanente Hospitals in 2010

<table>
<thead>
<tr>
<th>Race /Ethnicity</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacific Islander</td>
<td>18.3</td>
</tr>
<tr>
<td>Filipino</td>
<td>16.1</td>
</tr>
<tr>
<td>South Asian</td>
<td>15.9</td>
</tr>
<tr>
<td>Latino</td>
<td>14.0</td>
</tr>
<tr>
<td>African American</td>
<td>13.7</td>
</tr>
<tr>
<td>Native American</td>
<td>13.4</td>
</tr>
<tr>
<td>Southeast Asian</td>
<td>10.5</td>
</tr>
<tr>
<td>Japanese</td>
<td>10.3</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>9.9</td>
</tr>
<tr>
<td>Korean</td>
<td>9.9</td>
</tr>
<tr>
<td>Chinese</td>
<td>8.2</td>
</tr>
<tr>
<td>White</td>
<td>7.3</td>
</tr>
</tbody>
</table>

Karter AJ et al; Diabetes Care 2013: 36;574-9
Standardized Diabetes Incidence (per 1,000 Person-years) Among 16,283 Adults Diagnosed with Incident Diabetes in 2010, Kaiser Permanente Northern California

Elevated rates of diabetes in Asian subgroups

New cases per 1,000 person-years

- White
- African Am
- Latino
- Nat American
- Chinese
- Japanese
- Filipino
- South Asian
- Pacific Islander
- All Asians
- All API

Karter AJ et al. Diabetes Care 2013:36;574-9
Body Mass Index (BMI) Among 1,704,363 Adult Members, by Race and Diabetes Status, Kaiser Permanente Northern California, 2010
JS Yudkin and CS Yajnik, Lancet 2004; 363:157-63
Visceral Adipose Tissue (VAT) by Computed Tomography
African American vs Filipina Women

African-American, 62 yo
Weight: 160 lbs, Height: 5’7”
BMI=25 kg/m² VAT: 25.4cm³

Filipina-American, 69 yo
Weight: 115 lbs, Height: 5’4”
BMI=20 kg/m² VAT: 84.0 cm³

2015 ADA Guidelines for Asian Americans

• Background
  • Previous ADA guidelines recommended type 2 diabetes screening for asymptomatic adults, ages ≥ 45 years, with BMI ≥25 kg/m\(^2\) and one known risk factor, including Asian ethnicity.
  • A sizeable proportion of Asian Americans develop type 2 diabetes at BMI <25 kg/m\(^2\) and might not be screened.

• Objective
  • Identify optimum BMI cut points for type 2 diabetes screening among Asian-American adults (≥45 years) without a prior type 2 diabetes diagnosis
Methods: Study Population

• 1663 participants from
  o The UCSD Filipino Health Study in San Diego, CA
  o The North Kohala Study on the island of Hawaii
  o Mediators of Atherosclerosis among South Asians Living in America (MASALA) Study in San Francisco, CA and Chicago, IL
  o Seattle Japanese Diabetes Community Study in Seattle, WA
Methods: Study Population

- Self-reported Filipino, Japanese, South Asian, Chinese, Korean, and mixed Asian ancestry, without non-Asian admixture
- Ages ≥ 45 years
- No prior diagnosis of type 2 diabetes
- Concomitant measures of BMI and 75 gram two-hour Oral Glucose Tolerance Test (OGTT)
- Hemoglobin A1c (HbA1c) except among Filipino men (San Diego), Japanese (Seattle)
Methods: Clinical Measures

- 75 gram OGTT after 8 hour fast
- Fasting and 2-hour glucose by glucose oxidase method
- HbA1c by high performance liquid chromatography
- Height, weight

Demographic characteristics:
  - Age, sex, self-reported ethnicity and admixture

Type 2 diabetes by ADA 2010 criteria:
  HbA1c ≥6.5 % or FPG≥126 mg/dl or PPG ≥200 mg/dl
Methods: Statistical Analysis

• Receiver operating characteristic (ROC) curve analysis
• Calculated sensitivity, specificity, and positive predictive value
• Review of optimal BMI cut points included the following considerations:
  o Youden’s index: \( (sensitivity + specificity - 1) \)
  o Misclassification rate:
    ▪ False positive rate + False negative rate
    ▪ Sensitivity \( \sim \) Specificity
    ▪ Targeted sensitivity = 80%
## Demographic Characteristics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>698</td>
<td>42%</td>
</tr>
<tr>
<td>Women</td>
<td>965</td>
<td>58%</td>
</tr>
<tr>
<td>Filipino (San Diego, Hawaii)</td>
<td>536</td>
<td>32%</td>
</tr>
<tr>
<td>South Asian (San Francisco, Chicago)</td>
<td>609</td>
<td>37%</td>
</tr>
<tr>
<td>Japanese (Hawaii, Seattle)</td>
<td>500</td>
<td>30%</td>
</tr>
<tr>
<td>Other Asian (Hawaii)</td>
<td>18</td>
<td>1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>59.7</td>
<td>9.2</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>25.4</td>
<td>4.0</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>5.7</td>
<td>0.84</td>
</tr>
<tr>
<td>Fasting plasma glucose (mg/dl)</td>
<td>100.5</td>
<td>19.3</td>
</tr>
<tr>
<td>2 hour plasma glucose (mg/dl)</td>
<td>148.1</td>
<td>58.3</td>
</tr>
</tbody>
</table>

Araneta, Kanaya, Hsu et al *Diabetes Care* 2015;38(5):814-20
Age-adjusted Type 2 Diabetes Prevalence by Ethnicity

Araneta, Kanaya, Hsu et al *Diabetes Care* 2015;38(5):814-20
Age-adjusted Type 2 Diabetes Prevalence by Diagnostic Method (n=1214)

If screening limited to HbA1c and fasting glucose, almost half (44%) of Asian Americans with type 2 diabetes will be undiagnosed.
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/m²

37% of women and 21% of men with T2DM had BMI<25 kg/m²
### Type 2 Diabetes by BMI $\geq 25$ kg/m$^2$ Cut Point

<table>
<thead>
<tr>
<th>BMI (kg/m$^2$)</th>
<th>Type 2 diabetes</th>
<th>No diabetes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\geq 25$</td>
<td>179</td>
<td>730</td>
<td>907</td>
</tr>
<tr>
<td>$&lt; 25$</td>
<td>102</td>
<td>652</td>
<td>756</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>281</strong></td>
<td><strong>1382</strong></td>
<td><strong>1663</strong></td>
</tr>
</tbody>
</table>

36% (n=102) of Asian Americans with type 2 diabetes might be undiagnosed if screening is limited to BMI $\geq 25$ kg/m$^2$

**Sensitivity:** $\frac{179}{281} = 64\%$

**Specificity:** $\frac{652}{1382} = 47\%$

Youden’s index: $(64\% + 47\%) - 1 = 11\%$

Misclassification rate: $\frac{102}{281} + \frac{730}{1382} = 89\%$
### Type 2 Diabetes Prevalence, Sensitivity, and Specificity by BMI Cut Point, Asian-Americans, Ages ≥ 45 Years

<table>
<thead>
<tr>
<th>BMI (kg/m²)</th>
<th>Diabetes (%)</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Misclassification Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;23</td>
<td>238 (14.3)</td>
<td>84.7</td>
<td>28.8</td>
<td>0.87</td>
</tr>
<tr>
<td>&gt;24</td>
<td>208 (12.5)</td>
<td>74.0</td>
<td>40.7</td>
<td>0.85</td>
</tr>
<tr>
<td>&gt;25</td>
<td>179 (10.8)</td>
<td>63.7</td>
<td>52.8</td>
<td>0.84</td>
</tr>
<tr>
<td>&gt;26</td>
<td>145 (8.7)</td>
<td>51.6</td>
<td>65.3</td>
<td>0.83</td>
</tr>
<tr>
<td>&gt;27</td>
<td>122 (7.3)</td>
<td>43.4</td>
<td>73.6</td>
<td>0.83</td>
</tr>
<tr>
<td>&gt;27.5</td>
<td>102 (6.1)</td>
<td>36.3</td>
<td>77.8</td>
<td>0.86</td>
</tr>
</tbody>
</table>
Sensitivity at Selected BMI Cut Points

Diabetes screening at a lower cut point of BMI $\geq 23$ kg/m² should be considered and will enable early diagnosis and management.
Optimal BMI Cut Points at Targeted Sensitivity of 80%

<table>
<thead>
<tr>
<th></th>
<th>BMI (kg/m²)</th>
<th>Sensitivity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>23.5</td>
<td>80.3</td>
</tr>
<tr>
<td>Men</td>
<td>23.5</td>
<td>79.2</td>
</tr>
<tr>
<td>Women</td>
<td>23.5</td>
<td>78.9</td>
</tr>
<tr>
<td>Filipino</td>
<td>23.6</td>
<td>79.5</td>
</tr>
<tr>
<td>South Asian</td>
<td>23.4</td>
<td>79.4</td>
</tr>
<tr>
<td>Japanese</td>
<td>22.8</td>
<td>80.9</td>
</tr>
</tbody>
</table>

With a targeted sensitivity of 80%, the optimal BMI cut point is 23.5 kg/m².
Optimal BMI Cut Points at Targeted Sensitivity of 80%

<table>
<thead>
<tr>
<th>T2DM diagnosis by:</th>
<th>BMI (kg/m²)</th>
<th>Sensitivity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c &gt; 6.5%</td>
<td>24.0</td>
<td>78.9</td>
</tr>
<tr>
<td>FPG &gt; 126 mg/dl</td>
<td>23.4</td>
<td>79.1</td>
</tr>
<tr>
<td>PPG &gt; 200 mg/dl</td>
<td>23.2</td>
<td>81.8</td>
</tr>
</tbody>
</table>
Summary and Conclusions

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

• A BMI cut point of $\geq 23$ kg/m$^2$ may be most practical for Asian Americans.

• Limiting screening to HbA1c and fasting glucose measures may fail to identify nearly half of Asian Americans with diabetes.
American Diabetes Association Revised Screening Guidelines, Effective January 2015

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

Diabetes Care 2015;38:1–9 | DOI: 10.2337/dc14-2391

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 In-
Strengths and Limitations

Strengths:
• Population/community based samples
• Type 2 diabetes ascertained by HbA1c and OGTT among all participants

Limitations:
• Not representative of all Asian Americans (no OGTT measures among Chinese, Korean, Vietnamese cohorts)
Acknowledgements

The authors thank the study participants for their time and commitment, and their clinical research teams.

This work was supported by the National Institutes of Health (DK-31801, R03-DK-60575, HL-093009, K24-HL-112827, DK-31170, DK-02654, DK-02860, DK-48152, DK-50703, DK-55460, DK-17047, DK-55460, DK-35876, HL-07028, HL-49293, RR-00037, HL-29393, U01-HL-079163, and G12-RR-03061) and the Department of Veterans Affairs.
DIABETES IN ASIAN AMERICANS – “SCREEN AT 23”
Who Are We, the Asians?

• In 2014, we represented about 5.9% of the US population (about 18.5 million of 314.1 million) and are the fastest growing racial/ethnic group driven by immigration.

• The term “Asian” refers to a person with origins in the Far East, Southeast Asia, or the Indian subcontinent and includes, but is not limited to, Asian Indians, Cambodians, Chinese, Filipinos, Hmong, Japanese, Koreans, Pakistanis, and Vietnamese.

• The largest Asian American subpopulation is Chinese (23%), followed by Filipino (20%), Asian Indian (18%), Vietnamese (10%), and Korean (10%).

2014 American Community Survey 1-Year Estimates, Asian Alone or in Any Combination
## Countries with Highest Estimated Diabetes Cases – WHO 2000 and 2030

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>India</td>
<td>32</td>
</tr>
<tr>
<td>2.</td>
<td>China</td>
<td>21</td>
</tr>
<tr>
<td>4.</td>
<td>Indonesia</td>
<td>8</td>
</tr>
<tr>
<td>5.</td>
<td>Japan</td>
<td>7</td>
</tr>
<tr>
<td>6.</td>
<td>Pakistan</td>
<td>5</td>
</tr>
<tr>
<td>8.</td>
<td>Brazil</td>
<td>5</td>
</tr>
<tr>
<td>9.</td>
<td>Italy</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>Bangladesh</td>
<td>3</td>
</tr>
</tbody>
</table>

*Diabetes Care 2004;27:1047-1053*
# Diabetes Prevalence in the U.S.

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

10 Leading Causes of Death in 2009 in the U.S.

**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*
Conclusions

• The science shows that, when it comes to diabetes, Asian Americans **ARE** different.
• The guidelines now reflect this reality.
• Screening practices must change to reflect these guidelines.
“Screen at 23” Campaign

• Purpose is to increase awareness and action among physicians, health authorities, and the general public of the screening guideline

• Organized by the AANHPI Diabetes Coalition (a coalition of over twenty diabetes research and advocacy organizations)

• Supported by National Council of Asian Pacific Islander Physicians, ADA and Joslin Diabetes Center
“Screen at 23” Campaign

- First launched in San Francisco in October 2015
- Shared with and presented to different national, regional and local organizations across the country
- Developed a tool kit for physicians, *Diabetes in Asian Americans*
- Developed a tool kit for patients/community residents, *The Eight Steps to Avoid, Control or Reverse Diabetes*
For Additional Information

www.screenat23.org

Ho Luong Tran, MD, MPH
National Council of Asian Pacific Islander Physicians

www.ncapip.org
CULTURALLY TAILORED STRATEGIES AND APPROACHES IN DIABETES PREVENTION AND MANAGEMENT FOR ASIAN AMERICANS
Asian American (AA) Population in the U.S.

- **AAs make up 5.4% of the total U.S. population**
  

- **Top AA Population in the U.S.**

  Source: US Census Bureau, 2010

  - California
  - New York
  - New Jersey
  - Texas
  - Hawaii
  - Washington
  - Virginia
  - Florida
# The 18 Largest U.S. Asian Groups by Country of Origin

(based on self-described race or ethnicity)

<table>
<thead>
<tr>
<th>#</th>
<th>Group</th>
<th>Population</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Chinese</td>
<td>4,347,014</td>
<td>22.2%</td>
</tr>
<tr>
<td>#2</td>
<td>Filipino</td>
<td>3,648,933</td>
<td>18.6%</td>
</tr>
<tr>
<td>#3</td>
<td>Asian Indian</td>
<td>3,461,017</td>
<td>17.7%</td>
</tr>
<tr>
<td>#4</td>
<td>Vietnamese</td>
<td>1,907,256</td>
<td>9.7%</td>
</tr>
<tr>
<td>#5</td>
<td>Korean</td>
<td>1,768,644</td>
<td>9.0%</td>
</tr>
<tr>
<td>#6</td>
<td>Japanese</td>
<td>1,433,105</td>
<td>7.3%</td>
</tr>
<tr>
<td>#7</td>
<td>Pakistani</td>
<td>480,585</td>
<td>2.5%</td>
</tr>
<tr>
<td>#8</td>
<td>Cambodian</td>
<td>322,605</td>
<td>1.6%</td>
</tr>
<tr>
<td>#9</td>
<td>Hmong</td>
<td>286,211</td>
<td>1.5%</td>
</tr>
<tr>
<td>#10</td>
<td>Other Asian</td>
<td>311,573</td>
<td>1.6%</td>
</tr>
<tr>
<td>#11</td>
<td>Thai</td>
<td>274,899</td>
<td>1.4%</td>
</tr>
<tr>
<td>#12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#13</td>
<td>Laotian</td>
<td>261,324</td>
<td>1.3%</td>
</tr>
<tr>
<td>#14</td>
<td>Taiwanese</td>
<td>173,087</td>
<td>0.9%</td>
</tr>
<tr>
<td>#15</td>
<td>Bangladeshi</td>
<td>170,145</td>
<td>0.9%</td>
</tr>
<tr>
<td>#16</td>
<td>Indonesian</td>
<td>112,005</td>
<td>0.6%</td>
</tr>
<tr>
<td>#17</td>
<td>Sri Lankan</td>
<td>54,412</td>
<td>0.3%</td>
</tr>
<tr>
<td>#18</td>
<td>Malaysian</td>
<td>31,54,412</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

NOTE: #7 Not Specific 529,170 2.7%; #10 Other Asian 311,573 1.6%
Source: 2013 American Community Survey 1-Year Estimates, Asian Alone or in Any Combination
Source: U.S. Census Bureau, Population Division, “Annual Estimates of the Resident Population 2013 (Race Alone or in Combination)
Graphic Source: Nielsen, 2012
Asian-American Nativity

- U.S. BORN
- FOREIGN BORN

Source: U.S. Census Bureau
American Community Survey 2013, five-year estimates

Graphic Source: Nielsen 2015
Adults in Poverty, 2010

- U.S. population: 13%
- U.S. Asians: 12%
- U.S. Asian groups:
  - Korean: 15%
  - Vietnamese: 15%
  - Chinese: 14%
  - Indian: 9%
  - Japanese: 8%
  - Filipino: 6%

Graphic adapted from Pew Research Center 2013
Educational Attainment & English Proficiency of Asian Adults, 2010 (%)

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than high school</td>
<td>14.4</td>
<td>13.9</td>
<td>18.0</td>
<td>7.7</td>
<td>9.2</td>
<td>29.7</td>
<td>7.7</td>
<td>4.8</td>
<td>18.8</td>
</tr>
<tr>
<td>High school or more</td>
<td>85.6</td>
<td>86.1</td>
<td>82.0</td>
<td>92.3</td>
<td>90.8</td>
<td>70.3</td>
<td>92.3</td>
<td>95.2</td>
<td>81.2</td>
</tr>
<tr>
<td>Bachelor's degree or more</td>
<td>28.2</td>
<td>49.0</td>
<td>51.1</td>
<td>47.0</td>
<td>70.0</td>
<td>25.8</td>
<td>52.6</td>
<td>46.1</td>
<td>36.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language</th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaks English “very well”</td>
<td>90.4</td>
<td>63.5</td>
<td>51.9</td>
<td>77.7</td>
<td>76.2</td>
<td>40.5</td>
<td>54.0</td>
<td>81.8</td>
<td>64.0</td>
</tr>
<tr>
<td>Speaks English less than “very well”</td>
<td>9.6</td>
<td>36.5</td>
<td>48.1</td>
<td>22.3</td>
<td>23.8</td>
<td>59.5</td>
<td>46.0</td>
<td>18.2</td>
<td>36.0</td>
</tr>
</tbody>
</table>

[Image]

- = highest
- = lowest

Graphic adapted from Pew Research Center 2013
Diversity within the Asian American Communities

1\textsuperscript{st} Generation Immigrant

- Monolingual
- Low Technology Literacy
- Low SES
- High Asian cultural influence

- Bilingual
- Moderate-High Technology Literacy
- Moderate – High SES
- High Asian cultural influence

2\textsuperscript{nd} Generation Immigrant

- Primarily English-speaking
- High technology Literacy
- Ranging SES status
- Moderate-High Asian cultural influence

- Only English-speaking
- High technology Literacy
- Ranging SES status
- Low Asian cultural influence
Chronic Care Model

Community
- Resources and Policies
  - Self-Management Support

Health System
- Health Care Organization
  - Delivery System Design
  - Decision Support
  - Clinical Information Systems

Informed, Activated Patient

Productive Interactions

Prepared, Proactive Practice Team

Improved outcomes

(Wagner et al., 1996; Wagner, 1998)
Challenges and Barriers

- Language
- Cultural and generational gaps
- Body concepts and image
- Stigma associated with diseases
Challenges and Barriers

Concept of Health and Disease Prevention

• Eastern medicine concept vs Western
  – Eastern emphasizes harmony, respect, yin-yang balance, collectiveness and community (Ino & Gliken, 1999; Spector, 1991)
  – Western medicine encourages forwardness, independence and autonomy in individual decision making (Ma, 1999)

• Diseases considered preventable or controllable only by maintaining balanced energy levels (Hoeman et al., 1996)

• Medication compliance/management: herbal med vs. western med

Challenges and Barriers
Dietary Practice

The Balance of Yin and Yang

Cool & Cold Foods

- seaweed
- burdock root
- asparagus
- broccoli
- celery
- corn
- eggplant
- lettuce
- winter melon
- lotus root
- potato
- watercress
- tomato
- barley
- tofu
- carrot
- banana
- grapefruit
- watermelon
- tea
- honeysuckle

- Clear heat
- Reduce anxiety
- Improve digestion
- Increase appetite

Source: Jun Wang Ph.D. C.M.D. L.Ac.
Graphic source: http://www.thegutsygourmet.net/post-shellfish.jpg
Challenges and Barriers
Dietary Practice

The Balance of Yin and Yang

Warm & Hot Foods

- beef
- chicken
- freshwater fish
- shrimp
- turkey
- ginger
- garlic
- pepper
- red jujubes
- danggui
- longon
- astragalus
- walnuts
- chestnuts
- cilantro
- green onion
- coffee
- brown sugar
- wine
- rice-vinegar

- Nourish Yang
- Replenish the blood
- Strengthen body

Source: Jun Wang Ph.D. C.M.D. L.Ac.
Graphic source: http://www.thegutsygourmet.net/post-shellfish.jpg
Challenges and Barriers

• Common health myths
  (e.g., eating sugar/sweets may cause diabetes)
• Access to care - high deductible and co-pay
Challenges and Barriers
Health-Seeking Pathway

Seek formal professional help
Engage particular healing to find cure
Consult friends and relatives
Practice self-care/home remedy
Link information with physical health
Search for information from various sources

Graphic source: akyoto.tumblr.com
Source: Pang et al., 2003.
Promoters

- Cultural competency/humility
- Linguistic appropriateness
- Communication Style: verbal vs non-verbal
- Family involvement
Strategy/Approach

• Providing culturally-appropriate practical services/programs/tools
  – Nutrition counseling
  – Patient navigation
  – Support groups
Strategy/Approach

• Example
To assess the efficacy of support group on the understanding & management of diabetes among participants

• Findings
Average improvement of participants’ knowledge on diabetes was 18%.
Average reduction in HbA1c from baseline was 2%.

Sun et al., 2012
Strategy/Approach - Utilizing Technology

**Total Population**
- 60% Broadband at home
- 82% Cell phone
- 52% Laptop
- 57% Wireless connectivity

**Asian Americans**
- 80% Broadband at home
- 90% Cell phone
- 74% Laptop
- 77% Wireless connectivity

*English-speaking


Source: Nielsen Total Audience Report, Q4 2014
Graphic source: Nielsen, 2015
A survey in 2013 of 403 Chinese American immigrants age 50 to 75

we found that:

- 52% had smartphones
- 86% had Internet access at home
- 72% used the Internet for health info
- 53% would like to learn how to use smartphones to improve their health

Sun et al., 2013
Strategy/Approach - Using Culturally Appropriate Tools

Example

Multi-Media & Tools

We are proud to offer a variety of educational tools and materials in multiple Asian languages and a wide range of formats from books to iPhone applications. Our resources are intended to help keep the Asian and Pacific Islander community informed on pressing health topics in a culturally relevant and linguistically competent manner.

Please visit the links below to learn more about multimedia materials and educational tools from AAFH member agencies:

Tools

Stop Smoking (only in Chinese)

Needs Assessment - Online Stop Smoking Resource

Body Mass Index - Adults

Body Mass Index - Children

Calorie Counter

Healthy Choices - Grocery Shopping Tips

Nutrition & Physical Activity

Nutrient Analysis

Pregnancy Due Date

Stress Management/Bullying & Depression

Target Heart Rate Calculator

www.AsiansforHealth.org
Strategy/Approach - Utilizing Ethnic Media

Growth of Asian Media Outlets

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2010</th>
</tr>
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<tbody>
<tr>
<td>Print</td>
<td>68</td>
<td>409</td>
</tr>
<tr>
<td>TV</td>
<td>16</td>
<td>136</td>
</tr>
<tr>
<td>Radio</td>
<td>18</td>
<td>140</td>
</tr>
<tr>
<td>Digital</td>
<td>0</td>
<td>554</td>
</tr>
<tr>
<td>TOTAL</td>
<td>102</td>
<td>1239</td>
</tr>
</tbody>
</table>

(1115% increase from 1999-2010)

Number of Asian Media Outlets 2010

<table>
<thead>
<tr>
<th></th>
<th>Chinese</th>
<th>Korean</th>
<th>Vietnamese</th>
<th>Filipino</th>
<th>Asian Indian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print</td>
<td>121</td>
<td>68</td>
<td>76</td>
<td>64</td>
<td>50</td>
</tr>
<tr>
<td>TV</td>
<td>37</td>
<td>26</td>
<td>18</td>
<td>14</td>
<td>30</td>
</tr>
<tr>
<td>Radio</td>
<td>32</td>
<td>22</td>
<td>34</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>Digital</td>
<td>147</td>
<td>84</td>
<td>69</td>
<td>87</td>
<td>94</td>
</tr>
<tr>
<td>TOTAL</td>
<td>337</td>
<td>200</td>
<td>197</td>
<td>183</td>
<td>195</td>
</tr>
</tbody>
</table>

Sources: U.S. Census 2010 for language; IW Group for media
Graphic Sources: Nielsen, 2012
Strategy/Approach - Forming Partnership with Faith-based Community

Source: Pew Research Center 2013
Strategy/Approach - Facilitating Communication Between Provider and Patient

Compared to any other racial-ethnic group, Asian Americans most often cite poor doctor–patient relations because of their race, limited English ability, and low health literacy.

To facilitate communication, use

- Pictures and models
- Translators, if lack of bilingual and bilingual staff
- Language in lay-people’s terms and avoid jargon
- In-language materials
- Demonstrations and ask for returned demonstrations, if apply
- Appropriate body language

(Yoo, 2014)
Conclusion: Achieving Patient Centered Diabetes Care

- Cultural sensitivity
- Partnership
- Patient centered delivery method for messages
- Effective communication
- Patient empowerment
- Family involvement and social support
- Team approach
Thank You

Chinese Community Health Resource Center
www.cchrchealth.org

Asian Alliance For Health
www.asiansforhealth.org
References


POLICY, SYSTEMS AND ENVIRONMENTAL (PSE) INTERVENTION STRATEGIES FOR PACIFIC ISLANDERS BY PACIFIC ISLANDERS
Age-standardized diabetes prevalence in adult women, 2014

The Lancet 2016 387, 1513-1530
Age-standardized diabetes prevalence in adult men, 2014
## Diabetes in USAPI

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Year</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guam</td>
<td>2002-2003</td>
<td>11%</td>
</tr>
<tr>
<td>FSM</td>
<td>2002</td>
<td>24%</td>
</tr>
<tr>
<td>RMI</td>
<td>2002</td>
<td>30%</td>
</tr>
<tr>
<td>Palau</td>
<td>2006</td>
<td>39%</td>
</tr>
<tr>
<td>American Samoa</td>
<td>2004</td>
<td>47%</td>
</tr>
<tr>
<td><strong>United States</strong></td>
<td><strong>2007</strong></td>
<td><strong>8%</strong></td>
</tr>
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</table>

Background

• **Ebeye (Kwajalein), Republic of the Marshall Islands**
  – Population: 12,000
  – Land: 6.33 square miles
  – Median Household Income: $14,195

• **Risk Factors**
  – 91% consume < 5 servings of fruits and vegetables (f and v) per day
  – 66% low level of physical activity
  – 63% obese or overweight
Community Building Approach

• **Engage the community**
  – Association for Asian and Pacific Community Health Organizations
  – Ebeye Community Health Center
  – Kwajalein Diabetes Coalition
  – Kwajalein Atoll Community at large

• **Build capacity: Kwajalein Diabetes Coalition**
  – Coalition building
  – Coalition infrastructure technical assistance
  – Planning and evaluation support

“It’s not just the ‘sector’ it is the heart, trust, leadership and honesty”
“Good first step but not the only step”
PSE Interventions: Nutrition

- **Policy**
  - Legislative: Remove tax on fruits and vegetables

- **Systems**
  - Ebeye CHC: FARMacy, Recipe Book and Cooking Classes

- **Environment**
  - Community and Individual Gardens
PSE Interventions: Physical Activity

• **Policy**
  – Churches adapt *Pacific Physical Activity Guidelines for Adults*

• **Systems**
  – Ebeye CHC: Prescribe physical activity (Fitness Center)

• **Environment**
  – Fitness center
  – Walking path
PSE Interventions: Health Management

• **Policy**
  – Stigma Policy: Kwajalein Diabetes Day (2^{nd} Monday of April)

• **Systems**
  – Clinical and treatment Protocols

• **Environment**
  – Family Model Diabetes Education
Outcomes

• **Nutrition**
  – CHANGE Tool (PSE)
    • Policy Score: 22% to 55%
    • Environment Score: 22% to 57%
  – Diabetes patients
    • Average f&v consumption/day: 0.86 to 2.80 servings
    • Percent consume at least 5 servings of f&v/day: 2% to 8%

• **Physical activity (PA)**
  – CHANGE Tool (PSE)
    • Policy Score: 28% to 63.64%
    • Environment Score: 49% to 68%
  – Diabetes patients
    • Average PA: 100 to 195.62 Metabolic Equivalent of Task (MET) minutes per week
    • Percent engage in moderate to high levels of PA: 1% to 4%
Outcomes

- **Health management**
  - **CHANGE Tool (PSE)**
    - Policy Score: 48% to 84%
    - Environment Score: 48% to 84%
  - **Diabetes patients:**
    - Average HbA1c: 9.2% to 8.4%
    - Percent of patients with HbA1c less than 9%: 19% to 39% (need recent)
Coalition Capacity Monitoring and Evaluation

- **Monitoring, reflecting and celebration calls and visits**
  - Monthly SKYPE meetings
  - On-visit

- **Coalition effectiveness survey scores**
  - 2010: 0
  - 2012: 359 (82%)
  - 2015: 406 (93%)

- **Outcome**
  - Chartered Non Profit Organization
  - Kwajalein RIAK Coalition (All NCDs including tobacco and cancer)

- **Sustainability & future plans**
  - RIAK Plan 2
  - RMI NCD and Cancer Program
  - Policy Roles: Mayor and City Managers

Coalition Participants: Lead (Convening Agency), Support Staff, Leaders and Members; Coalition Structure (By-laws, goals, org chart, etc.); Coalition process (Decision Making, resources allocation, etc.); and Stages of Coalition Development (Formation, Maintenance and Institutionalization)
Pacific Healthy Community Indicators

- Healthy people
- Healthy environment (social and physical)
- Healthy culture
Acknowledgements

• **Association of Asian Pacific Community Health Organization (AAPCHO):** Melinda Martin, Michelle Ninde, Allan Gamboa, Natalie Ah Soon, Nina Agbayani and Jeff Caballerro

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• **Kwajalein Diabetes Coalition (Diak Coalition):** Romeo Alfred, Odrikawa Jatios, Scott Paul, Marcella Sakaio, Oling de Brum, Kiorong Sam, Noland De Brum, Sef Korok Calvin Juda, Lanjo Lanwe, Herinos Enos and Joma Maie

• **Partners:** RMI NCD Program, RMI CCC Program, Kumit Bobrae (Tobacco) Coalition, Youth to Youth in Health (YTYIH), Ruk Jen Leen Women’s Chapter, Kwajalein Atoll Joint Utility Resource (KAJUR), Environmental Protection Agency (EPA), Ebeye Hotel (MIDB), RMI Resource and Development (RND), Republic of China (Taiwan Embassy), RMI CMI Land Grant, RMI Office of Environmental Planning, And Policy Coordination (OEPPC) Canvasback Missions, Kwajalein Wellness Program Inc., Marshall Islands Journal, National Telecommunication Agency (NTA), United Church of Christ, Assembly of God Calvary Church, New Beginning Church, Catholic Church (Queen of Peace), Church of Latter-Day Saints
Visit CDC NDEP’s New Website
http://www.cdc.gov/diabetes/ndep

Asian Americans, Native Hawaiians, and Pacific Islanders have high rates of diabetes
Learn ways you can prevent or delay the disease.

The National Diabetes Education Program (NDEP) works with partners to reduce the burden of diabetes and prediabetes by facilitating the adoption of proven approaches to prevent or delay the onset of type 2 diabetes and the complications of diabetes. NDEP is a joint program of the Centers for Disease Control and Prevention and the National Institutes of Health.

PARTNERING WITH NDEP
Learn about NDEP and find partnership resources.

WORKING IN COMMUNITIES
Find tools to help implement community programs.

WORKING IN HEALTH SETTINGS
Find resources to support team care.

TRAINING & TECHNICAL ASSISTANCE
Find webinars and courses to build your capacity.

FOR PEOPLE AT RISK FOR DIABETES
Find information on preventing type 2 diabetes.

FOR PEOPLE WITH DIABETES
Find information on managing diabetes.

FIND RESOURCES FOR SPECIFIC GROUPS

AMERICAN INDIANS & ALASKA NATIVES
AFRICAN AMERICANS & AFRICAN ANCESTRY
HISPANIC & LATINO AMERICANS
ASIAN AMERICANS, NATIVE HAWAIIAN & PACIFIC ISLANDERS
Healthy Eating Tips

Reviewed for Plain Language Principles
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  – zlf2@cdc.gov
Thank you!
Learn more from the National Diabetes Education Program

National Diabetes Education Program
Call 1-800-CDC-INFO (800-232-4636)
TTY 1-(888)-232-6348 or visit www.cdc.gov/info
To order resources, visit https://nccd.cdc.gov/DDT_DPR/
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• To receive credit:
  – Complete the activity
  – Complete the Evaluation at [www.cdc.gov/TCEOnline](http://www.cdc.gov/TCEOnline)
  – Pass the posttest with 60% at [www.cdc.gov/TCEOnline](http://www.cdc.gov/TCEOnline)

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