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Saturday August 11, 2018 1:30 PM – 2:00 PM, 5th AANHPI diabetes Coalition Conference, Boston

US CDC Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention
Background

Diabetes estimates >> Age-adjusted prevalence of diabetes (20-79), % (2015)

Countries/territories with:
- <4%
- 4-5%
- 5-7%
- 7-9%
- 9-12%
- >12%
- No Data

http://www.diabetesatlas.org/across-the-globe.html
**Background**

- The prevalence of diabetes is high in Asian populations with significant variation across Asian countries.

- Asian ancestral Americans (AsA) comprise about 6% of the US population and are the fastest growing segment.

- There is limited national information on the prevalence of diabetes among AsA and no reports among different AsA subgroups.
Purpose

1. To determine the prevalence of diabetes among AsA and three major AsA subgroups.

2. To compare the prevalence of diabetes among AsA subgroups, and to that of other US racial/ethnic groups.
US National Health and Nutrition Examination Survey

- NHANES is an on-going US nationally representative survey of the noninstitutionalized civilians.
- It includes health-related questions, physical examination, and laboratory tests, such as A1c, fasting plasma glucose (FPG), and glycemia after 2-hr 75-g glucose challenge (2hPG).
- Since 2011, NHANES oversamples non-Hispanic, non-black AsA participants.
- We report 2011-2014 population estimate using 9,808 men and non-pregnant women aged ≥20 years
Race/ethnicity (non-pregnant adults aged 20 or older)

- Non-Hispanic white \((n = 4,472 \text{ (total)}, 1,592 \text{ (with A1c, FPG, 2hPG)})\)
- Non-Hispanic black \((n = 2,594 \text{ (total)}, 705 \text{ (with A1c, FPG, 2hPG)})\)
- Mexican American \((n = 1,296 \text{ (total)}, 459 \text{ (with A1c, FPG, 2hPG)})\)
- Non-Hispanic AsA \((n = 1,446 \text{ (total)}, 492 \text{ (with A1c, FPG, 2hPG)})\)
  - East AsA \((n = 565)\) : Chinese, Japanese, Korean (3 countries)
  - South AsA \((n = 336)\) : Asian Indian, Pakistani, Sri Lankan, Bangladeshi, Nepali, Bhutanese (6 countries)
  - Southeast AsA \((n = 381)\) : Filipino, Vietnamese, Cambodian, Laotian, Thai, Indonesian, Malaysian, Singaporean, and Hmong (9)
  - Other AsA \((n = 164)\)

Reference: Paulose-Ram (AJPH 2017)
Diabetes status/Co-variates

Multiple approaches used to define diabetes mellitus (DM) status:

- **Diagnosed diabetes**: Having Self-reported of professional diagnosed DM
- **Undiagnosed diabetes** (given adults without diagnosed diabetes)
  - A1c ≥6.5% (47.5 mmol/mol)
  - Or, FPG ≥126 mg/dl (7.0 mmol/l)
  - Or, 2hPG ≥200 mg/dl (11.1 mmol/l)
- **Total diabetes**: Having diagnosed DM or undiagnosed DM

**Co-variates**: age, sex, race/ethnicity

- **Extra analyses**: birth place (Foreign-born vs. US-Born), BMI (kg/m²)
Statistical analysis

- Polytomous logistic regression was used for modeling the prevalence of diabetes with adjusting for other covariates.
- Predicted marginal proportions of diabetes status were reported and compared among different subgroups.
- Stata 15.1 (StataCorp, College Station, TX) was used for analyzing data accounted for the complex survey design.
Age-, Sex-Adjusted Prevalence of Diagnosed Diabetes in US Adults by Race/Ethnicity, NHANES 2011-2014

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White, non-Hispanic</td>
<td>7.9**</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>14.6**</td>
</tr>
<tr>
<td>Mexican American</td>
<td>14.8*</td>
</tr>
<tr>
<td>AsA, non-Hispanic</td>
<td>11.2 (ref.)</td>
</tr>
<tr>
<td>East AsA</td>
<td>7.2 (ref.)</td>
</tr>
<tr>
<td>South AsA</td>
<td>15.4**</td>
</tr>
<tr>
<td>Southeast AsA</td>
<td>14.1**</td>
</tr>
<tr>
<td>Other AsA</td>
<td>9.8</td>
</tr>
</tbody>
</table>

* p <0.05, ** p <0.01, *** p <0.001
Age-, Sex-Adjusted Prevalence of **Total Diabetes** in US Adults by Race/Ethnicity, NHANES 2011-2014

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White, non-Hispanic</td>
<td>11.5***</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>20.8</td>
</tr>
<tr>
<td>Mexican American</td>
<td>23.1</td>
</tr>
<tr>
<td>AsA, Non-Hispanic</td>
<td><strong>20.6 (ref.)</strong></td>
</tr>
<tr>
<td>East AsA</td>
<td>16.0 (ref.)</td>
</tr>
<tr>
<td>South AsA</td>
<td>24.8*</td>
</tr>
<tr>
<td>Southeast AsA</td>
<td>23.3*</td>
</tr>
<tr>
<td>Other AsA</td>
<td>18.5</td>
</tr>
</tbody>
</table>

† total diabetes: self-reported diagnosed diabetes, HbA1c≥6.5%, FPG ≥126 mg/dl, or 2hPG ≥200 mg/dl
* p <0.05, ** p <0.01, *** p <0.001
Age-, Sex-Adjusted Prevalence of Undiagnosed Diabetes† in US Adults by Race/Ethnicity, NHANES 2011-2014

† undiagnosed diabetes: no diagnosed diabetes but HbA1c≥6.5%, FPG ≥126 mg/dl, or 2hPG ≥200 mg/dl

* p <0.05, ** p <0.01, *** p <0.001
Age-, Sex-Adjusted **Proportion of Undiagnosed Diabetes**†
in US Adults with Diabetes, NHANES 2011-2014

<table>
<thead>
<tr>
<th>Group</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White, Non-Hispanic</td>
<td>31.1**</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>29.5</td>
</tr>
<tr>
<td>Mexican American</td>
<td>37.0</td>
</tr>
<tr>
<td>AsA, non-Hispanic</td>
<td>45.0 (ref.)</td>
</tr>
<tr>
<td>East AsA</td>
<td>55.7 (ref.)</td>
</tr>
<tr>
<td>South AsA</td>
<td>37.3*</td>
</tr>
<tr>
<td>Southeast AsA</td>
<td>40.7</td>
</tr>
<tr>
<td>Other AsA</td>
<td>46.5</td>
</tr>
</tbody>
</table>

†undiagnosed diabetes: no diagnosed diabetes but HbA1c ≥6.5%, FPG ≥126 mg/dl, or 2hPG ≥200 mg/dl

* p <0.05, ** p <0.01, *** p <0.001
Proportion of Undiagnosed Diabetes† by Type of Test in US Adults with Undiagnosed Diabetes, NHANES 11-14

† undiagnosed diabetes: no diagnosed diabetes but HbA1c ≥6.5%, FPG ≥126 mg/dL, or 2hPG ≥200 mg/dL

** p <0.01
Hierarchical Proportion of Undiagnosed Diabetes† by Type of Test in US Adults with Undiagnosed Diabetes, NHANES 11-14

† undiagnosed diabetes: no diagnosed diabetes but HbA1c ≥6.5%, FPG ≥126 mg/dL, or 2hPG ≥200 mg/dL

** p < 0.01
Age- and Sex-Adjusted Distribution of HbA1c

HbA1c percentile among adults without diabetes

- White, non-Hispanic
- AsA, non-Hispanic
- Mexican American
- Black, non-Hispanic

Percentile, %

HbA1c, %

4.7 4.9 5.1 5.3 5.5 5.7 5.9 6.1 6.3 6.5
Age- and Sex-Adjusted Distribution of FPG

FPG percentile among adults without diabetes

- Black, non-Hispanic
- White, non-Hispanic
- AsA, non-Hispanic
- Mexican American
Age- and sex-adjusted distribution of 2-h post-challenge glucose

2hPG percentile among adults without diabetes

- White, non-Hispanic
- Black, non-Hispanic
- Mexican American
- AsA, non-Hispanic
US-Born status

After adjusting for the age, sex, and BMI:

- Among total US adults
  - Foreign-born adults had 90% higher undiagnosed diabetes than US-born adults ($p = 0.026$)

- Among non-Hispanic AsA
  - Foreign-born adults had 100% higher total diabetes prevalence than their US-born counterparts ($p = 0.029$)
Summary/Conclusion

- Overall, AsA had similar prevalence of total diabetes as Mexican Americans and non-Hispanic blacks, which was higher than whites.
- Among AsA subgroups, South AsA had the highest prevalence of total diabetes.
- Among US adults, AsA had the highest undiagnosed diabetes prevalence, and East AsA with diabetes had the lowest awareness of diabetes.
- The findings indicate that AsA need tailored interventions for increasing diabetes awareness and prevention.
Questions?

For more information, contact CDC
1-800-CDC-INFO (232-4636)

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