

Pregnancy and Infant
Health Indicators
Among Asian and
Pacific Islanders
within the State of
Michigan:
2016 Report



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Abbreviations Used

API: Asian and Pacific Islander

NHPI: Native Hawaiian and Other Pacific Islander

HI/G/C/S: Native Hawaiian, Guamanian or Chamorro, Samoan

P/B/N: Pakistani, Bhutanese, Nepalese

OPI: Other Pacific Islander

OAS: Other Asian Not Specified

NHW: Non-Hispanic White

NHB: Non-Hispanic Black or African American

BMI: Body Mass Index (Weight in kilograms divided by height in meters squared)

GDM: Gestational Diabetes Mellitus

PNC: Prenatal Care

IWG: Inadequate Gestational Weight Gain (Weight gain less than recommended amount according to pre-pregnancy BMI)

LBW: Low Birthweight (Less than 2,500 grams)

HBW: High Birthweight (Greater than 4,000 grams)

PTB: Preterm Birth (Less than 37 weeks estimated gestation)

C-Section: Cesarean Section

NICU: Neonatal Intensive Care Unit

95% CI: 95% Confidence Interval

MDHHS: Michigan Department of Health and Human Services

DVRHS: Division for Vital Records and Health Statistics

HDRMHS: Health Disparities Reduction and Minority Health Section

Executive Summary

Asian and Pacific Islander (API) populations are some of the fastest growing racial/ethnic groups in Michigan.^{1,2} This project highlighted many health disparities within Michigan's API populations and Michigan's overall population, based on information from Michigan birth certificates.

◆ **The API populations in Michigan are diverse.**

API births whose groups are regularly reported on birth certificates, such as Asian Indian, Chinese and Korean, constituted about 75% of the births for this project. Data were also included on groups that were entered on the birth certificate in the "Other Asian" write-in category, but not regularly recorded on the birth certificate (called "new" groups in this report—e.g. Hmong, Laotian, Thai, Bangladeshi). Although three of the groups were not categorizable by country of origin (called "uncategorizable" groups in this report) they still contributed to a significant portion of API births.

◆ **There is large variation in health status between API ethnic groups.**

Maternal and pregnancy characteristics for new groups, including Hmong, Laotian, Bangladeshi, and Burmese, varied significantly from the regularly reported Asian groups and overall API group. More mothers in these new smaller groups were unmarried, had not graduated from high school, intended to use Medicaid as payment for birth, and did not receive prenatal care in the first trimester of pregnancy than the overall API population. The Vietnamese, Pacific Islander groups, and the uncategorizable Asian group and API multiple race also varied significantly from the regularly reported Asian groups.

◆ **Grouping API populations together masks health-related indicators in small groups.**

When all API groups are reported together in one estimate, differences within the groups are hidden. Although many of the new API ethnic groups had worse maternal demographics and pregnancy characteristics, these groups are smaller in size and their differences are not well accounted for when all API groups are reported together.

◆ **Health indicators related to social and economic status are important to consider.**

The greatest disparities arose in the indicators that reflected social and economic positions of the mothers. Addressing these disparities requires an understanding and examination of the potential root causes of these outcomes. Many of the new and uncategorizable groups had higher risk profiles for pregnancy than the overall API proportions. In spite of these, pregnancy outcomes in these groups did not appear to differ from the overall API outcomes.

◆ **Stereotypes of API persons are unhelpful in health care settings.**

This report demonstrated disparities exist both within Michigan's API populations and between this diverse group and Michigan's overall population. Michigan's API population had higher proportions of gestational diabetes mellitus, inadequate gestational weight gain, and C-section deliveries than the overall Michigan proportion. These data contradict stereotypes often ascribed to API persons, and highlight their inappropriateness in health care settings.

◆ **Improved data recording is necessary.**

This report is an important step in unmasking disparities within Michigan's API populations. Understanding the reasons for the existing disparities requires additional investigation. Improvement in the recording of the write-in categories of "Other Asian" and "Other Pacific Islander" categories on the Michigan birth certificate is necessary for continued improvement in the ongoing public health surveillance of these populations.

Introduction

The Asian population is one of the fastest growing racial/ethnic groups in the United States (US)[†]; from 2000-2010 the percent of the population that reported their ethnicity as Asian grew more than four times (46%) faster than the population growth rate of the US (10%).¹ The Native Hawaiian and Other Pacific Islander (NHPI) population[†] also experienced tremendous growth in the US, with the population who reported NHPI as their ethnicity increasing at a similar rate as the Asian population (40%).² Asian is defined by the US Census as persons who indicated their ethnicity(s) as “Asian or Asian Indian, Chinese, Filipino, Korean, Japanese, Vietnamese, or other detailed Asian response”.¹ NHPI is defined as persons who indicated their ethnicity(s) as “Native Hawaiian, Guamanian or Chamorro, Samoan, Other Pacific Islander, or other detailed Pacific Islander response”.²

The purpose of this report is to characterize the diversity of the API populations in Michigan and to highlight maternal and child health indicators with the aim of identifying the smaller ethnic groups in the API community that exhibit differences from the overall API estimates. Comparisons to Michigan’s overall population, as well as for the Non-Hispanic White (NHW), Non-Hispanic Black or African American (NHB), and Hispanic groups, are made to help place the health indicators in a wider context. Identification of health disparities within this group is an important first step in identifying public health actions.

There is a developing body of literature regarding Asian and Asian-American maternal and child health; however, there is very little information about Pacific Islander maternal and child health. This report will hopefully be a first step in identifying and addressing the needs and disparities of overlooked API groups in Michigan.

This report contains the following sections:

- Information about the Health Disparities Reduction and Minority Health Section’s history and mission
- An overview of the health indicators selected and individual fact sheet for each indicator
- Details of the data source and the identification of API ethnic groups, and limitations faced in the analysis

An appendix that contains the tables with the health indicator data for all groups included in our analysis is available to those who are interested.

This report is intended to provide information to public health practitioners, legislators, organizations serving racial and ethnic minorities, health care providers, and those interested in minority health.

[†] Asian alone or in combination; NHPI alone or in combination

Health Equity in Michigan: The Role of the Health Disparities Reduction and Minority Health Section

The release of the Federal *Report on Black and Minority Health*, also known as *The Heckler Report*, in 1985 spurred many actions designed to address health disparities in the US.³ Michigan established its Office of Minority Health 1988 by Executive Order. This office was intended to be the coordinating center of efforts directed at improving the health status of Michigan's minority populations. In 2004, the Office of Minority Health was renamed the Health Disparities Reduction and Minority Health Section (HDRMHS) to more fully address health inequities in the State of Michigan.⁴

The mission of the Michigan Department of Health and Human Services (MDHHS) HDRMHS is to provide a persistent and continuing focus on assuring health equity and eliminating health disparities among Michigan's populations of color. These populations include African Americans, American Indians and Alaska Natives, Arab and Chaldean Americans, Asian Americans and Pacific Islanders, and Hispanics and Latinos.⁴

Public Act 653 (PA-653) was passed in 2006 and mandates the State of Michigan "develop and implement a structure to address racial and ethnic health disparities in this state". HDRMHS is actively involved in monitoring this progress.⁴

In 2010 the *Michigan Health Equity Roadmap* was released. This document outlined the vision and framework of health disparities reduction and elimination in Michigan. The first key recommendation made in this document was improvement in data collection and quality to describe Michigan's minority populations.⁴

Ongoing efforts of HDRMHS to improve health equity for Michigan's minority populations include releases of the Health Equity Data Project, stand-alone Behavioral Risk Factor Surveys, and educational trainings designed to address disparities. The HDRMHS has and continues to provide funding and support to various health related initiatives for Asian American and Pacific Islander populations in Michigan. Such collaborations include the Healthy Asian American Project (colorectal and breast cancer education and screening); Asian Center of West Michigan (heart disease prevention); the Association of Chinese Americans (men's health); the Asian Center of SE Michigan (capacity building and Culturally and Linguistically Appropriate Services Standards); and, the West Michigan Asian American Association (health fair data standardization).

The HDRMHS also coordinated and funded a *Behavioral Risk Factor Survey* among Michigan's API populations in 2012. Although API adults were similar or healthier to all adults for many indicators, the confidence intervals were very wide. Multiple survey limitations and concern over the data quality and generalizability prompted the search for different sources of data that could provide information on the within-group differences in Michigan's API populations.⁵ This report represents the effort to improve data availability for these diverse populations.

The HDRMHS is committed to providing resources and education with the aim of eliminating health disparities and promoting health equity. Please visit the HDRMHS website for more information: <http://www.michigan.gov/minorityhealth>.

Asian and Pacific Islanders in Michigan

While Michigan's overall population has declined in the last decade, the Asian population has grown by 39%[†], and the NHPI population has grown by 28%[†].^{1,2} In 2010, Michigan's Asian[†] population was estimated to be 289,607, and accounted for 2.9% of the total state population.¹ It was estimated that 9,348 NHPI lived in Michigan in 2010.²

Geographically, the majority of Asians[†] in Michigan reside in the Southeast region of the state.⁶ The majority of this growth is attributed to international immigration.^{2,6} The automotive, technology, and health care industries have been the primary draw for the API populations to Michigan.⁶

Michigan's API populations are diverse. Michigan's industries attract some of the largest, most-educated, and healthiest Asian subpopulations including Asian Indian, Chinese, and Japanese.⁶ Michigan is also home to smaller subpopulations that tend to be less educated and at higher risk for adverse health outcomes than their counterparts, including Hmong, Burmese, and Bangladeshi.⁷ These groups do not share the same history, nor do they share the same life trajectory in Michigan. Population change within the API community from 2000-2010 ranged from growth of 230% for the Bangladeshi population to a loss of 41% for the Laotian population in the Detroit Combined Statistical Area (DCSA).⁶ Almost two-thirds (65%) of Asian Americans living in DCSA are foreign-born and 29% are limited-English proficient.⁶ The most common primary languages of limited-proficiency English speakers in this area were Bengali and Chinese for the 2009-2010 school year.⁶ Poverty rates in this area ranged widely from 41% for the Bangladeshi population to 6% for the Filipino population.⁶

In spite of the rapid growth and heterogeneity of Michigan's API populations, timely and accurate data for assessing and understanding health outcomes in these groups are scarce. Compounding this problem is the fact the Asian and NHPI populations are often grouped together, and the health indicators of the largest subgroups often mask the health states of the smaller subgroups.⁸ As a result, API populations are frequently attributed with better health status than that of other minority populations in state statuses and reports.⁷

[†] Asian alone or in combination; NHPI alone or in combination

Maternal and Child Health Indicators, Michigan 2009-2013

Pregnancy and childbirth are important periods for the lifelong health of both the mother and the infant. Birth outcomes like preterm birth (PTB) and low birthweight (LBW) are associated with many short and long term health outcomes, including infant mortality. Reducing infant mortality, PTB and LBW rates are also key health indicators listed in the Healthy People 2020 Objectives.⁹ Maternal and child health are considered crucial to the health status of the United US as a whole, and Healthy People 2020 targets indicate this.⁹

Data from this report were obtained from the Michigan Resident Live Birth File, 2009-2013, provided by the Division for Vital Records and Health Statistics (DVRHS) within MDHHS. Mothers who made any mention of API ethnicity were included in this dataset. The full description of methods can be found on page 20. A summary of indicators by API group is included in the following page.

Indicators in this report include:

Maternal Demographics	Birth Outcomes
<ul style="list-style-type: none"> Maternal Age < 20 Years Old 	<ul style="list-style-type: none"> C- Section Method of Delivery
<ul style="list-style-type: none"> Unmarried at time of birth 	<ul style="list-style-type: none"> Low Birthweight
<ul style="list-style-type: none"> Education < high school 	<ul style="list-style-type: none"> High Birthweight
<ul style="list-style-type: none"> Medicaid Intended Payment for Birth 	<ul style="list-style-type: none"> Preterm Birth
Pregnancy Characteristics	<ul style="list-style-type: none"> Neonatal Intensive Care Unit
<ul style="list-style-type: none"> Pre-pregnancy Body Mass Index ≥ 25 	<ul style="list-style-type: none"> Overall Infant Mortality
<ul style="list-style-type: none"> Gestational Diabetes 	
<ul style="list-style-type: none"> Prenatal Care Initiation in the First Trimester 	
<ul style="list-style-type: none"> Inadequate Weight Gain 	

Not Included in this Report:

Smoking prior to or during pregnancy and alcohol use during pregnancy were not included in this report, in spite of being important predictors of adverse pregnancy outcomes. This is because the reported incidence of these indicators on the birth certificate was very low, and many of the groups reported no use of either cigarettes or alcohol.

Indicator Summary, Michigan 2009-2013

	Age Less than 20 years	Unmarried at time of birth	Education Less than High School	Medicaid as intended payment for birth	Pre-pregnancy BMI greater than or equal to 25 kg/m ²	Gestational Diabetes Mellitus	Prenatal Care Initiation at 1st Trimester	Inadequate Weight Gain	Low Birth Weight	High Birth Weight	C-Section Final Method of Delivery	Preterm Birth	Neonatal Intensive Care Unit Admission
*Overall API													
Regularly Reported API Groups													
Asian Indian													
Chinese													
Korean													
Filipino													
Vietnamese													
Japanese													
Native Hawaiian/ Guamanian or Chamorro/ Samoan						N/A			N/A				
New API Groups													
Identified													
Hmong									N/A				
Laotian										N/A			
Thai	N/A												
Bangladeshi	N/A	N/A							N/A				N/A
Burmese									N/A				
Cambodian						N/A			N/A				
Pakistani/ Bhutanese/ Nepalese	N/A	N/A							N/A				
Indonesian/Malaysian	N/A	N/A	N/A					N/A	N/A	N/A			N/A
Births Not Categorizable into Specific API Group													
Other Asian Not Specified													
Other Pacific Islander Not Specified	N/A								N/A				
Asian/Pacific Islander Multiple Race													
Key													
* The overall API proportions are compared to the overall Michigan proportions, while specific API groups are compared to the overall API proportion													
The indicator is no different from the API proportion													
The indicator is worse than the overall API proportion													
The indicator is better than the overall API proportion													

N/A signifies indicators for which the denominator was less than 50 or the numerator was less than 5. Data source: Michigan Resident Live Birth File, 2009-2013; DVRHS; MDHHS.

Maternal Ethnicity, Michigan 2009-2013

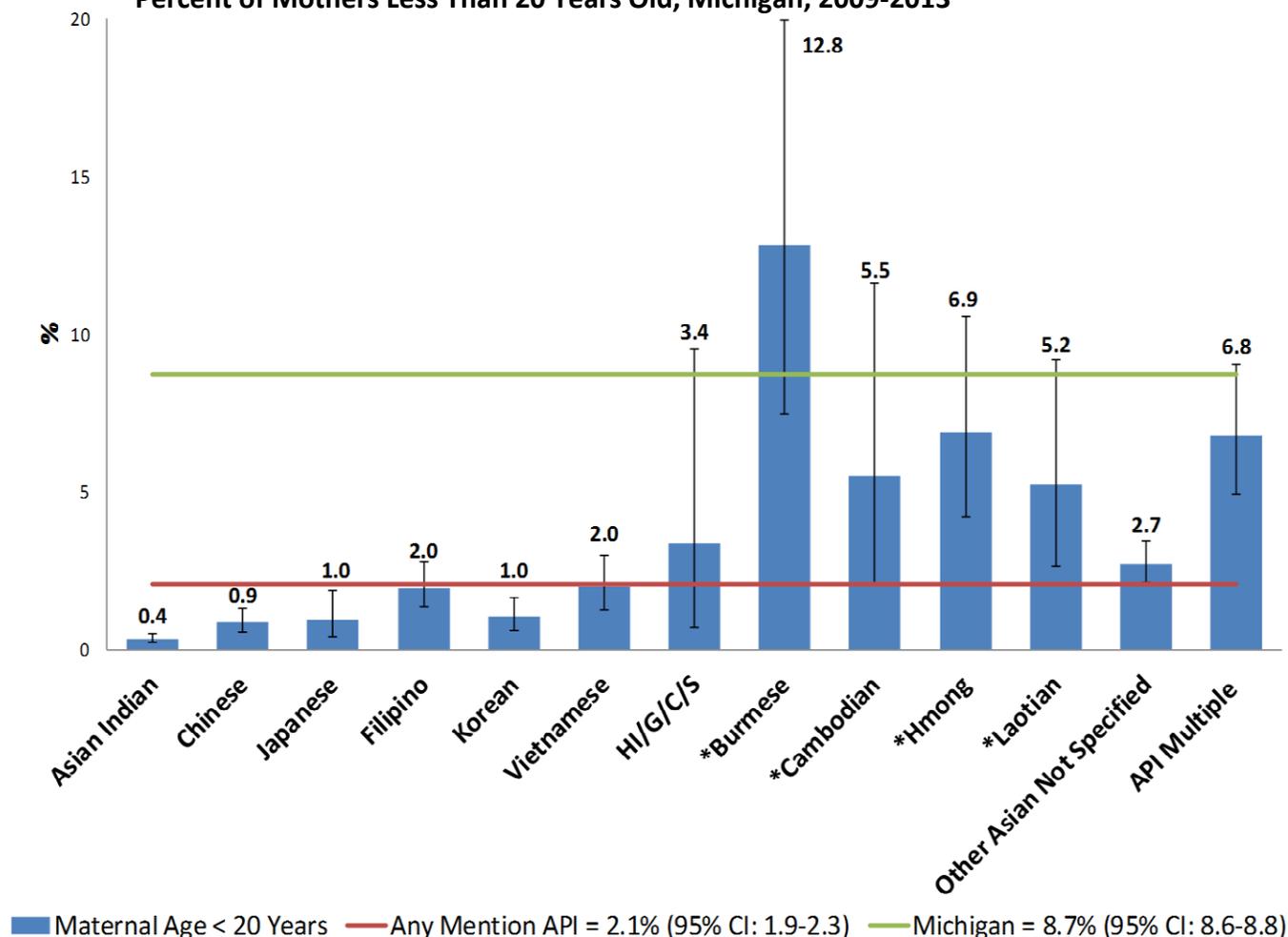
From 2009-2013, there were 562,599 live births to Michigan mothers. The API populations contributed 20,854 live births (3.7%). Over one-third (34.6%) of the births were from mothers reporting Asian Indian as their ethnic group. An estimated 72.2% of all the API births were from mothers who reported membership to one of the API ethnic groups regularly reported on birth certificates (e.g. Asian Indian, Chinese, Korean, Filipino, Vietnamese, Japanese, and Native Hawaiian, Guamanian or Chamorro, and Samoan). The new groups identified by this study comprised 5.5% of the API births. These groups included Hmong, Laotian, Thai, Bangladeshi, Burmese, Cambodian, Indonesian or Malaysian, and one group comprised of Pakistani, Bhutanese, and Nepalese. Births to mothers who were uncategorizable into groups according to country of origin on the birth certificate contributed about 15% of the API births, with 11.6% included in the “Other Asian Not Specified” group.

Table 1: API Ethnic Groups Included in this Report, 2009-2013	N	%
Total (Any Mention of API)^{†^}	20,864	100
Total Births from Regularly Reported API Groups	15,058	72.2
Asian Indian	7,209	34.6
Chinese	2,537	12.2
Korean	1,650	7.9
Filipino	1,578	7.6
Vietnamese	1,153	5.5
Japanese	842	4.0
~HI/G/C/S	89	0.4
New Groups Identified	1,138	5.5
*Hmong	276	1.3
*Laotian	210	1.0
*Thai	151	0.7
*Bangladeshi	139	0.7
*Burmese	125	0.6
*Cambodian	109	0.5
*~P/B/N	75	0.4
*~Indonesian/Malaysian	53	0.3
Births Not Categorizable into Specific Group	3,158	15.1
Other Asian Not Specified	2,428	11.6
Other Pacific Islander Not Specified	110	0.5
Asian/Pacific Islander Multiple Ethnicity	620	3.0
^Births to Non-API Bridged Race/Ethnicity Categories that Report API Ethnicity in Alternative Race Category	1,510	7.2

†Mothers who had plural birth only included once. *Indicates a group identified by literal text. ~Indicates collapsed categories due to denominators less than 50. ^Includes Bridged Race categories of White, Black or African American, American Indian/Alaska Native, White Multiple Race, Black Multiple Race, and American Indian/Alaska Native Multiple Race. Percents and frequencies will not sum to totals. For complete tables including these races, please see the appendix. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Maternal Age < 20 Years Old

Percent of Mothers Less Than 20 Years Old, Michigan, 2009-2013



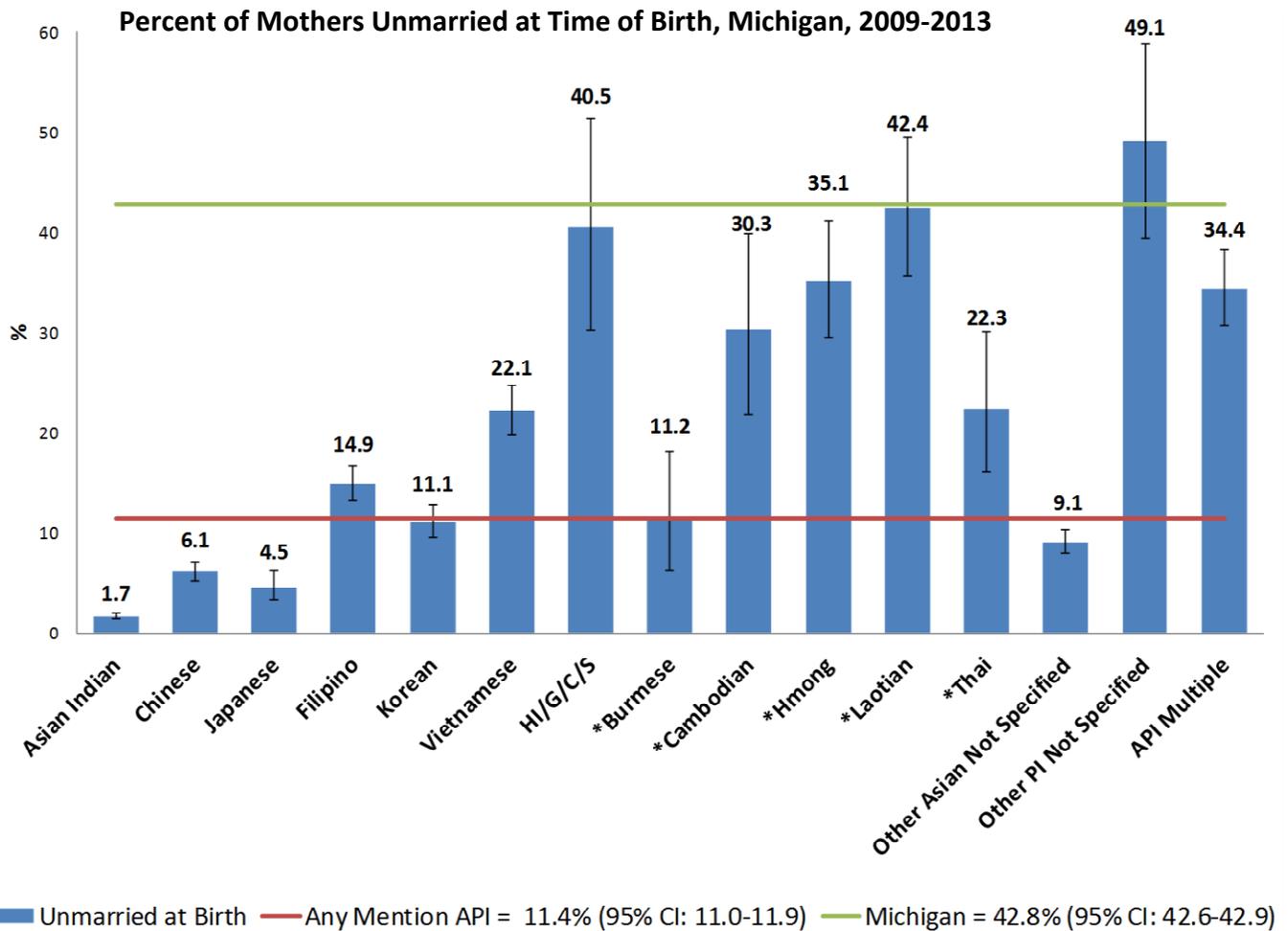
Evidence shows that adolescent mothers are at a higher risk for both mental and physical health problems than their adult counterparts.¹⁰ The maternal age variable was defined as the proportion of mothers in a group who gave birth at an age less than 20 years divided by the total number of mothers in the group.

In 2009-2013, the overall proportion of API mothers under the age of 20 years was only around 2.1% (95% CI: 1.9-2.3); however, many of the new groups identified, such as Burmese (12.8% [95% CI: 7.5-20.0]), Hmong (6.9% [95% CI: 4.2-10.5]), and Laotian (5.2% [95% CI: 2.6-9.2]), and some of the uncategorizable groups, such as API Multiple Ethnicity (6.8% [95% CI: 4.9-9.1]), experienced a significantly higher proportion of adolescent mothers compared to the API overall proportion. The regularly reported races, such as Asian Indian, Chinese, Japanese, and Korean had significantly lower proportions of mothers under the age of 20.

In Michigan overall, the proportion of births to adolescent mothers for the same years was 8.7% (95% CI: 8.6-8.8). The estimate for NHW mothers was 6.1% (95% CI: 6.0-6.2), while for NHB, the proportion was 17.2% (95% CI: 17.0-17.5), and for Hispanic mothers, the proportion was 13.2% (95% CI: 12.9-13.6). New groups, like Burmese, were higher than the overall Michigan estimate and the NHW estimate, although differences were not significant.

Data suppressed for Numerator < 5 or Denominator < 50: Bangladeshi, Indonesian/Malaysian, Thai, Pakistani/Bhutanese/Nepalese, OPI Not Specified. Mothers with plural births only counted once. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Unmarried at Time of Birth



Marriage is an important form of social support and is highly valued in many Asian cultures.⁷ Maternal marriage is associated with a reduced risk of adverse birth outcomes, such as PTB and LBW.¹¹⁻¹³

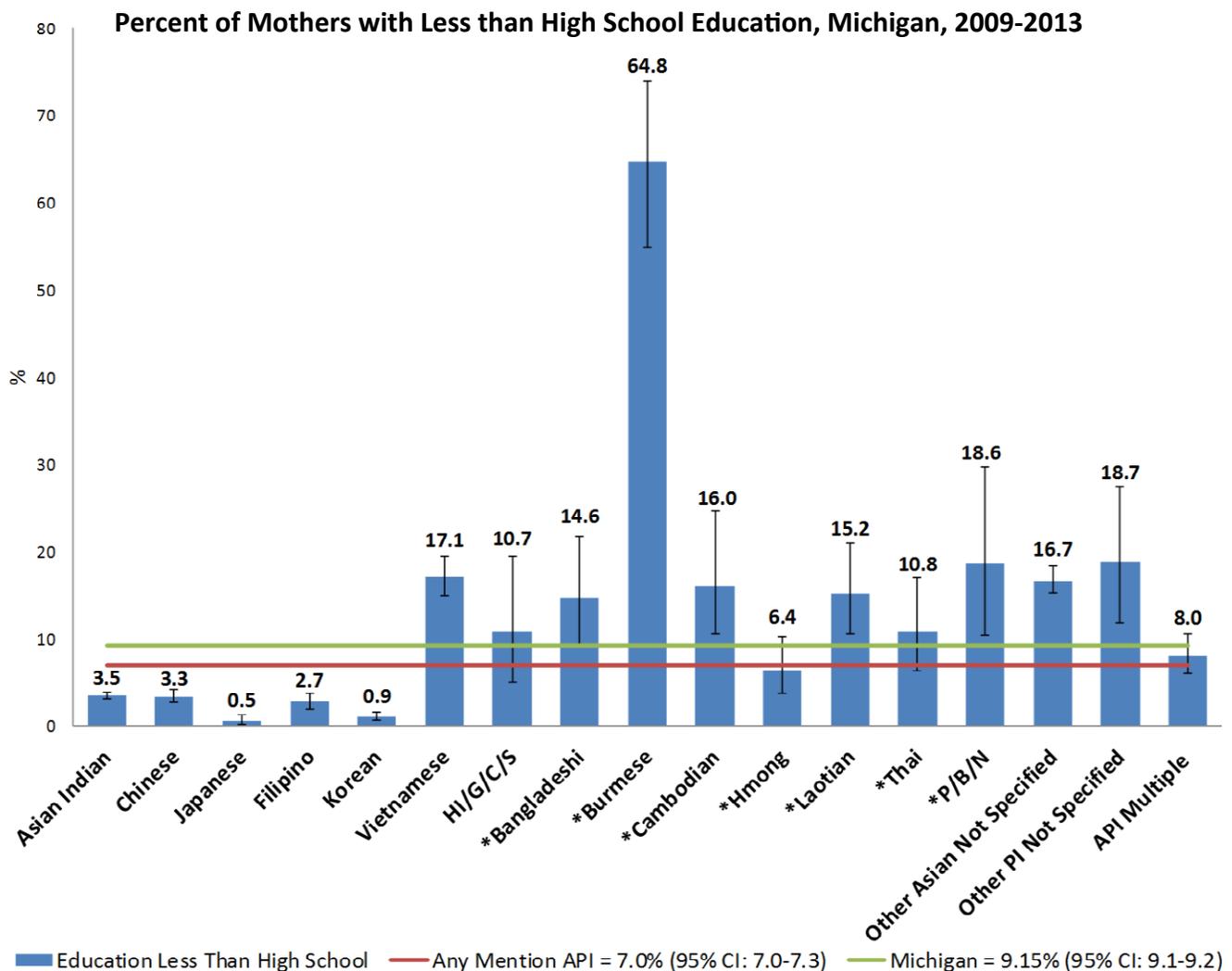
Unmarried at the time of birth was defined as the number of mothers who report an unmarried status, divided by the total number of mothers in the specific race group.

In 2009-2013, the overall proportion of API mothers unmarried at time of birth was 11.4% (95% CI: 11.0-11.9); a proportion significantly lower than the overall proportion in Michigan. New groups who were identified, like Cambodian (30.3% [95% CI: 21.8-39.8]), Hmong (35.1% [95% CI: 29.5-41.1]), and Laotian (42.4% [95% CI: 35.6-49.4]) and the some of the uncategorizable groups had a significantly higher proportion than the overall API proportion and the proportions for regularly reported groups. Native Hawaiian/Guamanian or Chamorro/Samoan (HI/G/C/S) mothers also experienced a higher proportion (40.5% [95% CI: 30.2-51.4]) than the overall API proportion, even though these groups are regularly reported.

For the same time period, the proportion of Michigan mothers unmarried at time of birth was 42.8% (95% CI: 42.6-42.9). NHW mothers had a proportion of 32.6% (95% CI: 32.5-32.8), while NHB, and Hispanic mothers had proportions of 80.9% (95% CI: 80.6-81.1) and 53.5% (95% CI: 53.0-54.0), respectively. The proportions of the new groups, such as Cambodian, Hmong, Laotian, and the uncategorizable groups were more similar to the overall Michigan proportion than the regularly reported API groups.

Data suppressed for Numerator < 5 or Denominator < 50: Bangladeshi, Indonesian/Malaysian, Pakistani/Bhutanese/Nepalese. Mothers with plural births only counted once. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Education less than High School



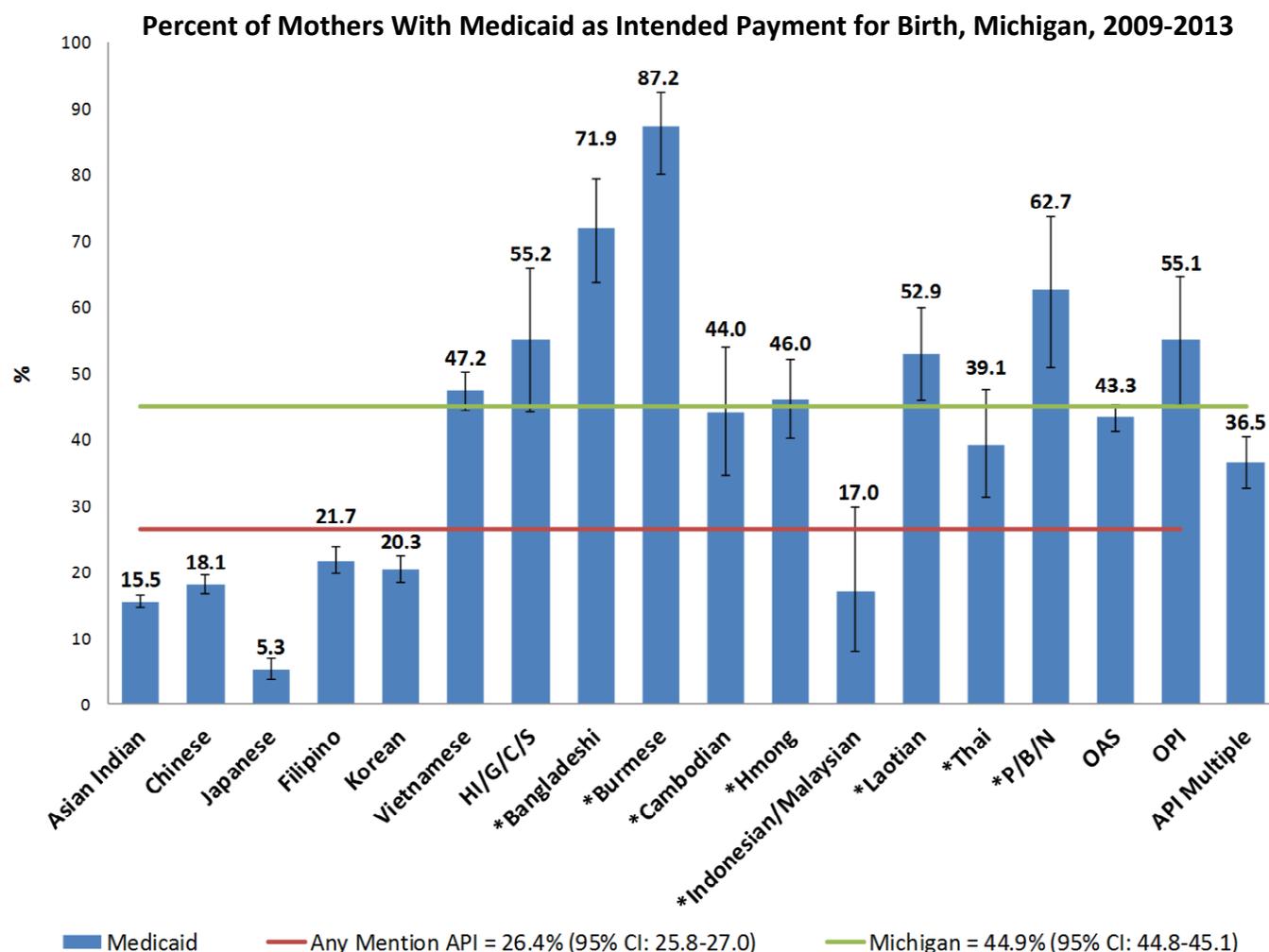
Maternal education has a strong association with adverse birth outcomes, including infant mortality. Education level is used as a proxy measure for socioeconomic position and is a common measure in health disparities research.^{12, 14, 15} The education less than high school variable was defined as the number of mothers aged 20 years and older without a high school diploma or GED in a specific race group, divided by the total number of mothers aged 20 years and older in that group.

From 2009-2013, the overall proportion of API mothers with less than high school education was 7.0% (95% CI: 7.0-7.3). Many of the new groups, such as Bangladeshi, Burmese, Cambodian, and Pakistani, Bhutanese, and Nepalese, had significantly higher proportions when compared to the overall API proportion and the regularly reported groups. The uncategorizable groups also had significantly higher proportions than the overall API proportion.

The overall proportion of Michigan mothers with less than a high school education or GED was 9.15% (95% CI: 9.1-9.2). The Burmese had a significantly higher proportion (64.8% [95% CI: 54.8-73.8]) than NHW (6.3% [95% CI: 6.3-6.4]), NHB (12.5% [95% CI: 12.3-12.7]), and Hispanics (29.1% [95% CI: 28.6-29.5]). However, the regularly reported groups, such as Asian Indian, which are also the largest API race groups in Michigan, had significantly lower estimates and mask the disparities found in the new groups and the uncategorizable groups when all API races are grouped together.

Data suppressed for Numerator < 5 or Denominator < 50: Indonesian/Malaysian. Mothers with plural births only counted once, mothers 20 years of age and older only. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Intended Payment for Birth: Medicaid



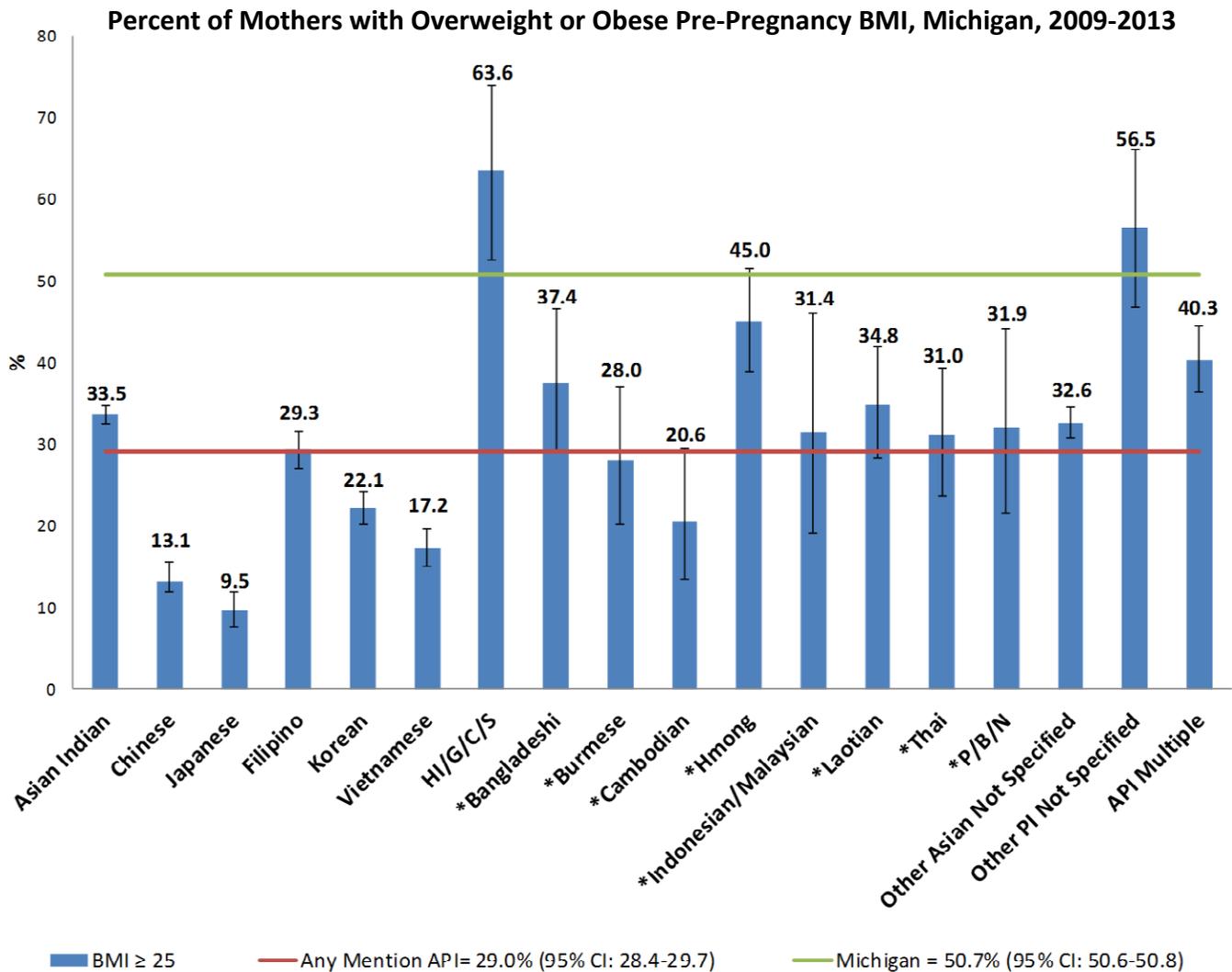
Socioeconomic status is an important predictor of birth outcomes.^{12,14,16} Mothers who report Medicaid insurance often have demographic profiles associated with high risk for adverse birth outcomes.¹⁷ The Medicaid variable was defined as the number of mothers in a specific group reporting Medicaid as the intended payment option, divided by the total number of mothers within that group.

From 2009-2013, the overall proportion of API mothers reporting Medicaid as the intended payment for the birth was 26.4% (95% CI: 25.8-27.0). The regularly reported groups, such as Asian Indian, Chinese, Japanese, Filipino, and Korean, had significantly lower proportions of mothers reporting Medicaid. New groups, such as Burmese (87.2% [95% CI: 80.1-92.5]), Bangladeshi and Pakistani/Bhutanese/Nepalese groups had significantly higher proportions than both the overall API and Michigan proportions (44.9% [95% CI: 44.8-45.1]). Some of the new groups, like Cambodian (44.0% [95% CI: 34.5-53.9]), Thai (39.1% [95% CI: 31.3-47.3]), and Hmong (46.0% [95% CI: 40.0-52.1]), had higher estimates than overall API but similar estimates to the overall Michigan. The Vietnamese and HI/G/C/S groups also followed this pattern.

NHW, NHB, and Hispanic mothers in Michigan had proportions of 39.1% (95% CI: 39.0-39.3), 57.8% (95% CI: 57.5-58.1), and 71.4% (95% CI: 71.0-71.9) respectively. The Burmese had a higher estimate than NHB and Hispanic estimates. These disparities are hidden when all API races are grouped together because the regularly reported have much lower proportions and are much larger in size.

Mothers with plural births only counted once. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Overweight or Obese Pre-Pregnancy BMI

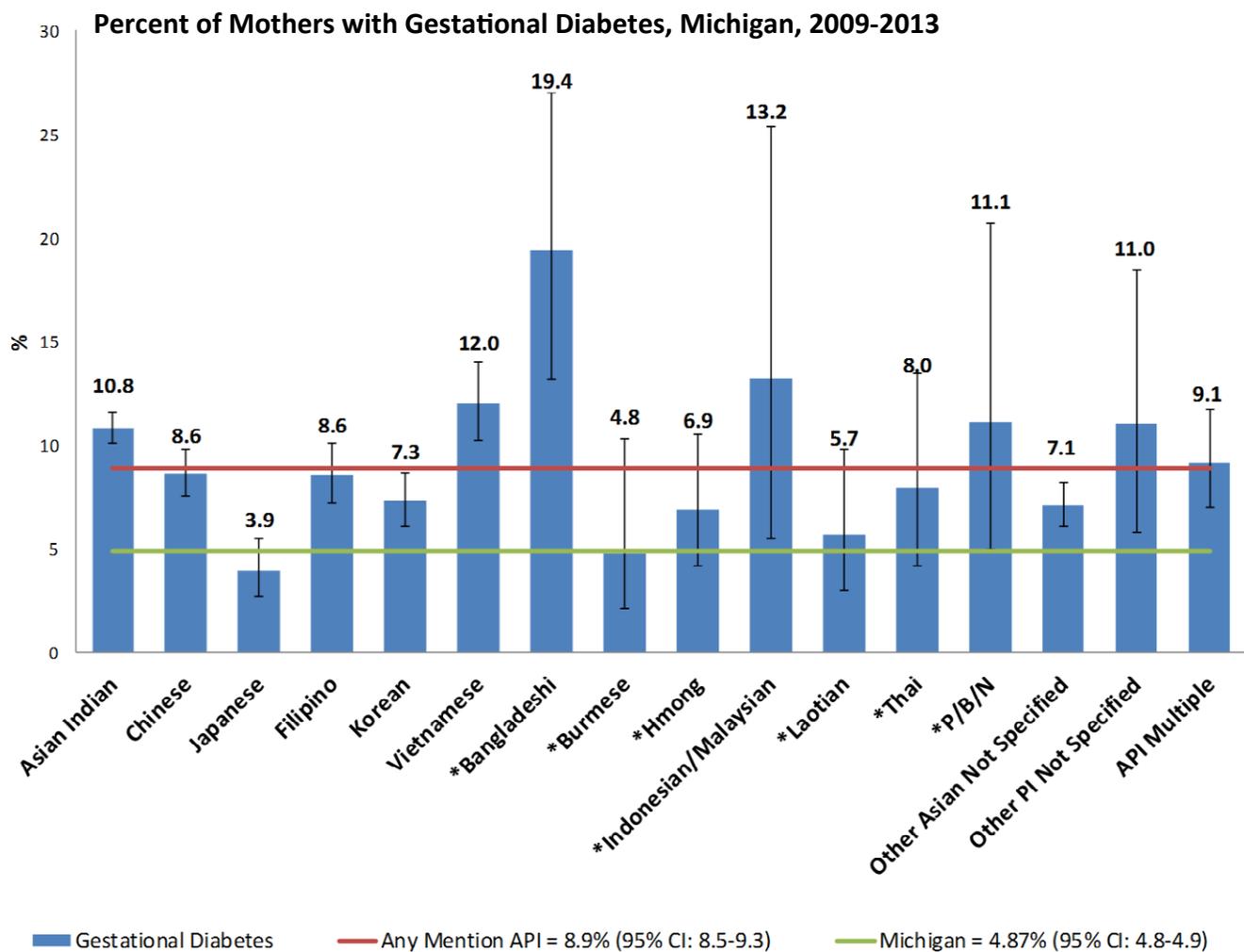


Overweight and obese pre-pregnancy Body Mass Index (BMI [weight in kg/(height in meters)²]) is associated with many adverse birth outcomes for both mother and child, including gestational diabetes, emergency C-section, and high birthweight (HBW).¹⁸ Long-term outcomes for the offspring can include childhood obesity and adverse cardio-metabolic profiles.¹⁹ Evidence suggests the heterogeneity of the Asian American population makes BMI a poor predictor of health outcomes, and lower BMI cut points may be necessary to identify individuals at risk for adverse health outcomes.²⁰⁻²¹ In the US, a cut point of 25 kg/m² delineates overweight, while a cut point of 30 kg/m² delineates obesity.²² The BMI variable was defined as the proportion of mothers with a pre-pregnancy BMI of 25 and greater in a race group, divided by the total number of mothers in the specific race group.

From 2009-2013, the overall proportion of API mothers with pre-pregnancy overweight or obesity was 29.0% (95% CI: 28.4-29.7). New groups, like the Hmong, and the uncategorizable groups, like OPI Not Specified, demonstrated a significantly higher proportion of mothers with pre-pregnancy BMIs greater than the overall API proportion, although they were not different from the overall Michigan proportion (50.7% [95% CI: 50.6-50.8]). The regularly reported group of HI/G/C/S (63.6% [95% CI: 52.4-73.7]) had a significantly higher proportion of mothers who were overweight or obese prior to pregnancy than the overall Michigan proportion and the NHW estimate (48.8% [95% CI: 48.6-48.9]), demonstrating the importance of reporting Pacific Island populations independently from Asian populations. For the same time period, estimates for NHB and Hispanic were 60.0% (95% CI: 59.7-60.3) and 56.5% (95% CI: 56.0-57.0), respectively.

Mothers with plural births only counted once. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Gestational Diabetes



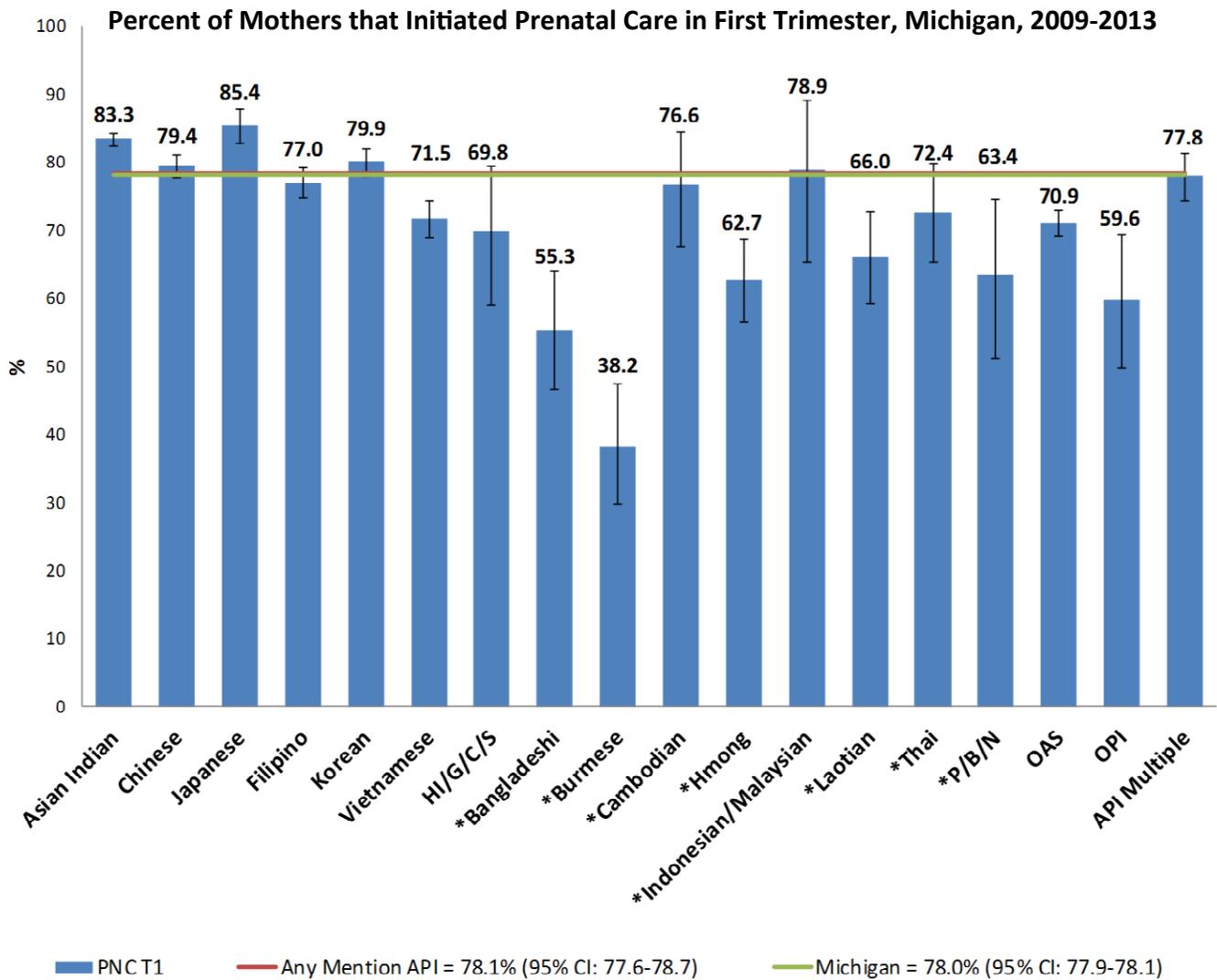
Gestational Diabetes Mellitus (GDM) is a type of diabetes that occurs only during pregnancy, and is a risk factor for adverse maternal and infant outcomes including HBW, stillbirth, childhood obesity, and adverse cardio-metabolic profiles in both the mothers and the offspring.²³⁻²⁴ Evidence suggests Asian populations may have a higher odds of GDM than NH White women in the US in spite of having lower pre-pregnancy BMI than NH White women.²⁵ The GDM variable was defined as the proportion of mothers who experienced GDM divided by the total number of mothers in each race group.

From 2009-2013, an estimated 8.9% (95% CI: 8.5-9.3) of API mothers reported GDM. The Bangladeshi group experienced a significantly higher proportion of GDM (19.4% [95% CI: 13.2-27.0]) than both the overall API proportion and the overall Michigan proportion (4.87% [95% CI: 4.8-4.9]). Many of the groups had estimates that were higher than both the overall API proportion, but had wide confidence intervals. Even with the width of the confidence intervals, many of the groups, including regularly reported API groups, like Asian Indian and Vietnamese, had higher proportions of GDM than the overall state of Michigan proportion.

The overall API proportion of GDM was about 2 times higher than the overall Michigan proportion as well as the NHW, NHB, and Hispanic proportions (4.9% [95% CI: 4.9-5.0], 3.6% [95% CI: 3.5-3.7], and 5.6% [95% CI: 5.4-5.9] respectively). The higher proportion of GDM for most of the API groups in Michigan warrants further investigation into why this disparity exists. This also suggests many of the traditional risk factors for GDM, such as pre-pregnancy BMI, may not predict risk in the API community.

Suppressed for Numerator < five or Denominator <50: Native Hawaiian/Guamanian, Chamorro, or Samoan, and Cambodian. Mothers with plural births only counted once. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Prenatal Care Initiation in First Trimester



Prenatal care (PNC) is an important component of a healthy pregnancy; early initiation of PNC identifies women with high risk pregnancies and ensures women with low risk pregnancies are progressing well.²⁶ There is evidence that PNC is utilized less in non-Western women living in the US.²⁷ The United States Healthy People 2020 Goal for First Trimester Initiation of Prenatal Care is to increase uptake to 77.9%.⁹ The PNC variable was defined as the proportion of mothers who initiated PNC in the first trimester within a specific race group, divided by the total number of mothers in that group.

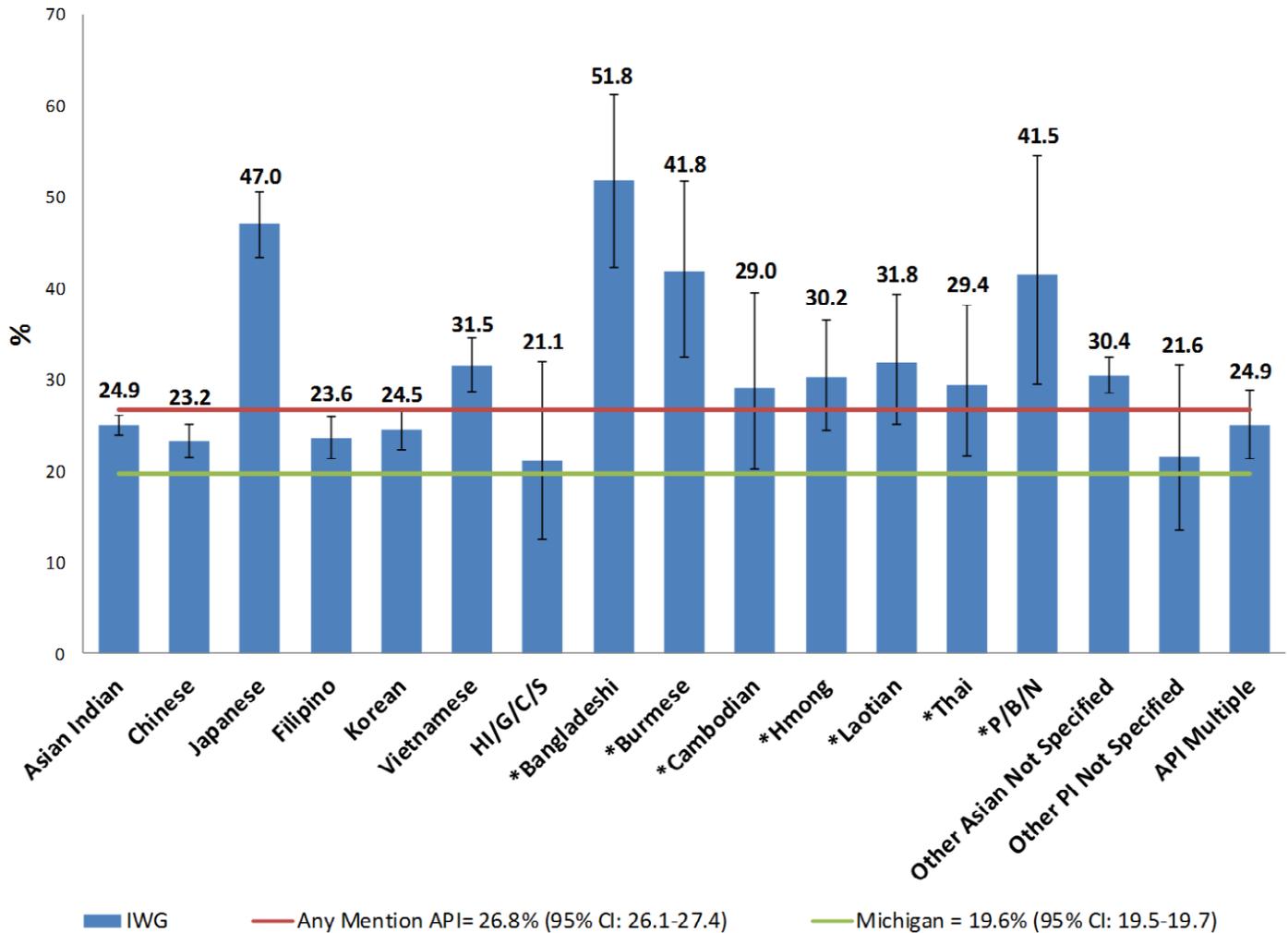
The overall API and overall Michigan proportions of first trimester uptake of PNC were similar (78.1% [95% CI: 77.6-78.7] and 78.0% [95%CI: 77.9-78.1], respectively). Several of the new and uncategorizable groups, like Bangladeshi (55.3% [95% CI: 46.4-64.0]), Burmese (38.2% [95% CI: 29.6-47.4]), Hmong (62.7% [95% CI: 56.4-68.6]), Other Asian Not Specified (70.9% [95% CI: 69.0-72.8]), and Other Pacific Islander Not Specified (59.6% [95% CI: 49.5-69.1]) had significantly lower proportions of PNC uptake in the first trimester than the overall API Michigan proportions. These groups also had lower proportions of uptake compared to NHW, NHB, and Hispanic proportions (81.0% [95% CI: 80.9-81.1], 69.3% [95% CI: 69.0-69.6], and 71.5% [95% CI: 71.1-72.0], respectively).

Identifying barriers to uptake of PNC in the first trimester is an important next step for understanding this health disparity among Michigan's vulnerable API groups.

Mothers with plural births only counted once. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Inadequate Gestational Weight Gain

Percent of Mothers with Inadequate Gestational Weight Gain, Michigan, 2009-2013



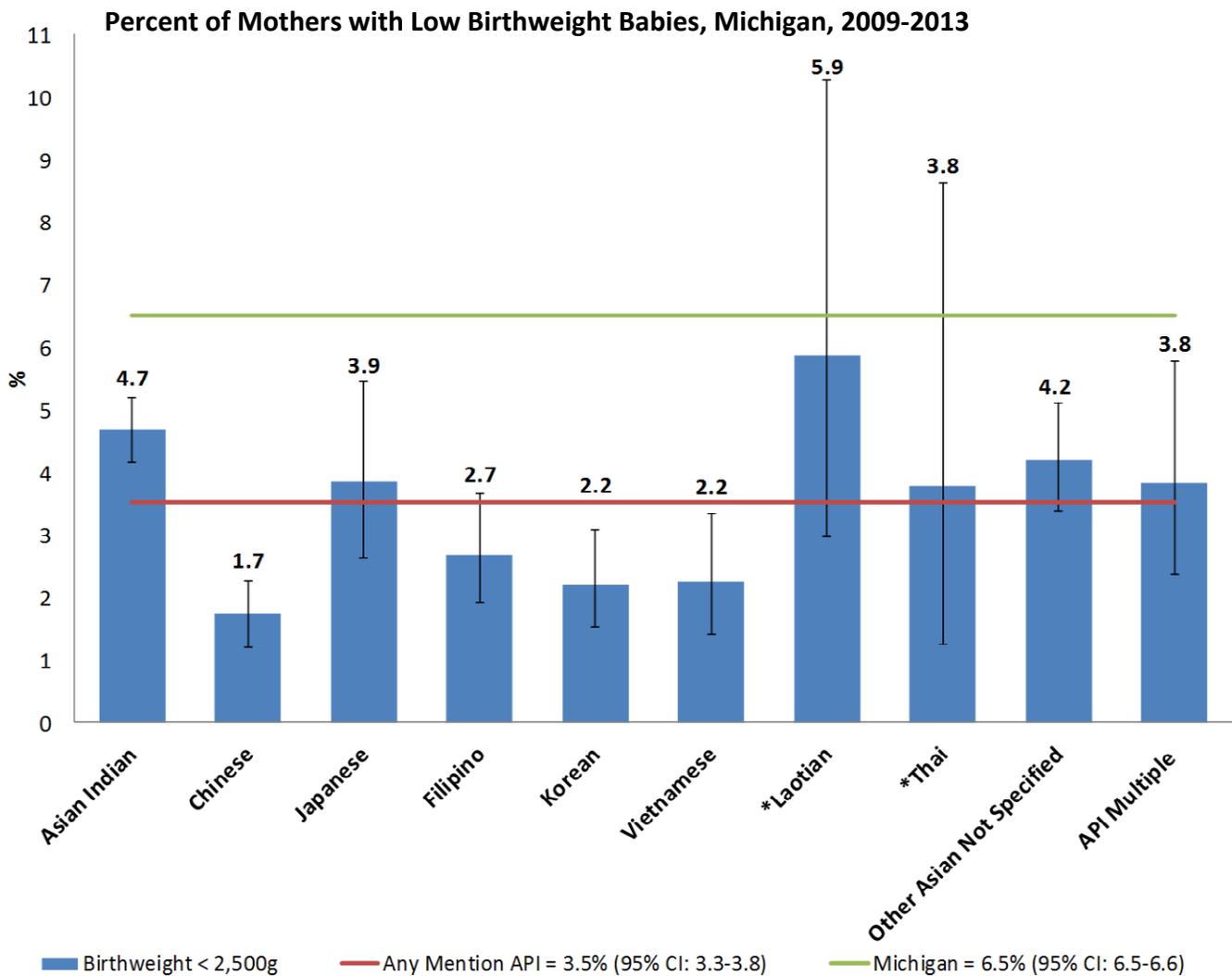
Inadequate gestational weight gain (IWG), or gaining less weight than recommended given pre-pregnancy BMI, increases risk of LBW and PTB, which are risk factors for neonatal mortality and morbidity.²⁸⁻²⁹ Some Asian American subgroups have higher rates of IWG than their NH White counterparts, but this is highly variable across subgroups.²⁵ The IWG variable was defined as the proportion of mothers who gave birth to singleton, term infants who did not gain adequate weight according to the 2009 Institute of Medicine Guidelines within a specific race group, divided by the total number of mothers within that race group.⁴⁴

The overall API proportion of IWG was 26.8% (95% CI: 26.1-27.4). Many of the new groups, like Bangladeshi (51.8% [95% CI: 42.2-61.2]), Burmese (41.8% [95% CI: 32.5-51.6]), and Pakistani/Bhutanese/Nepalese (41.5% [95% CI: 29.4-54.4]), had significantly higher proportions of IWG than the overall API proportion.

The overall proportion of IWG for API mothers was significantly higher than the overall Michigan proportion (19.6% [95% CI: 19.5-19.7]). The overall API proportion of IWG was significantly higher than NHW (18.0% [95% CI: 17.9-18.2]), NHB (22.3% [95% CI: 22.0-22.5]), and Hispanic (24.5% [95% CI: 24.0-24.9]) groups. Japanese, Bangladeshi, Burmese, and Pakistani/Bhutanese/Nepalese groups had proportions of IWG that were much higher than the overall API and Michigan proportions. Institute of Medicine guidelines for weight gain during pregnancy may not be appropriate for all API groups. Evidence suggests IWG may not be associated with poor birth outcomes for some API subgroups.³⁰ Also, lower BMI cut points may also need to be considered in regard to IWG.²⁰⁻²¹

Suppressed for Numerator < five or Denominator <50: Indonesian/Malaysian. Limited to singleton, term births. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Low Birthweight



Low birthweight (LBW) is a leading cause of infant mortality in the US, and is associated with both short term complications like chronic lung disease, and long term developmental complications such as attention deficits in survivors.³¹⁻³³ There is evidence that Asian populations have babies that are smaller than NHW, but not pathologically small.³⁴ The Healthy People 2020 goal for is to reduce LBW in the US to 7.8%.⁹ The LBW variable was defined as the proportion of singleton, term infants born weighing less than 2,500 grams, within a specific race group, divided by the total number of singleton, term infants in that group.

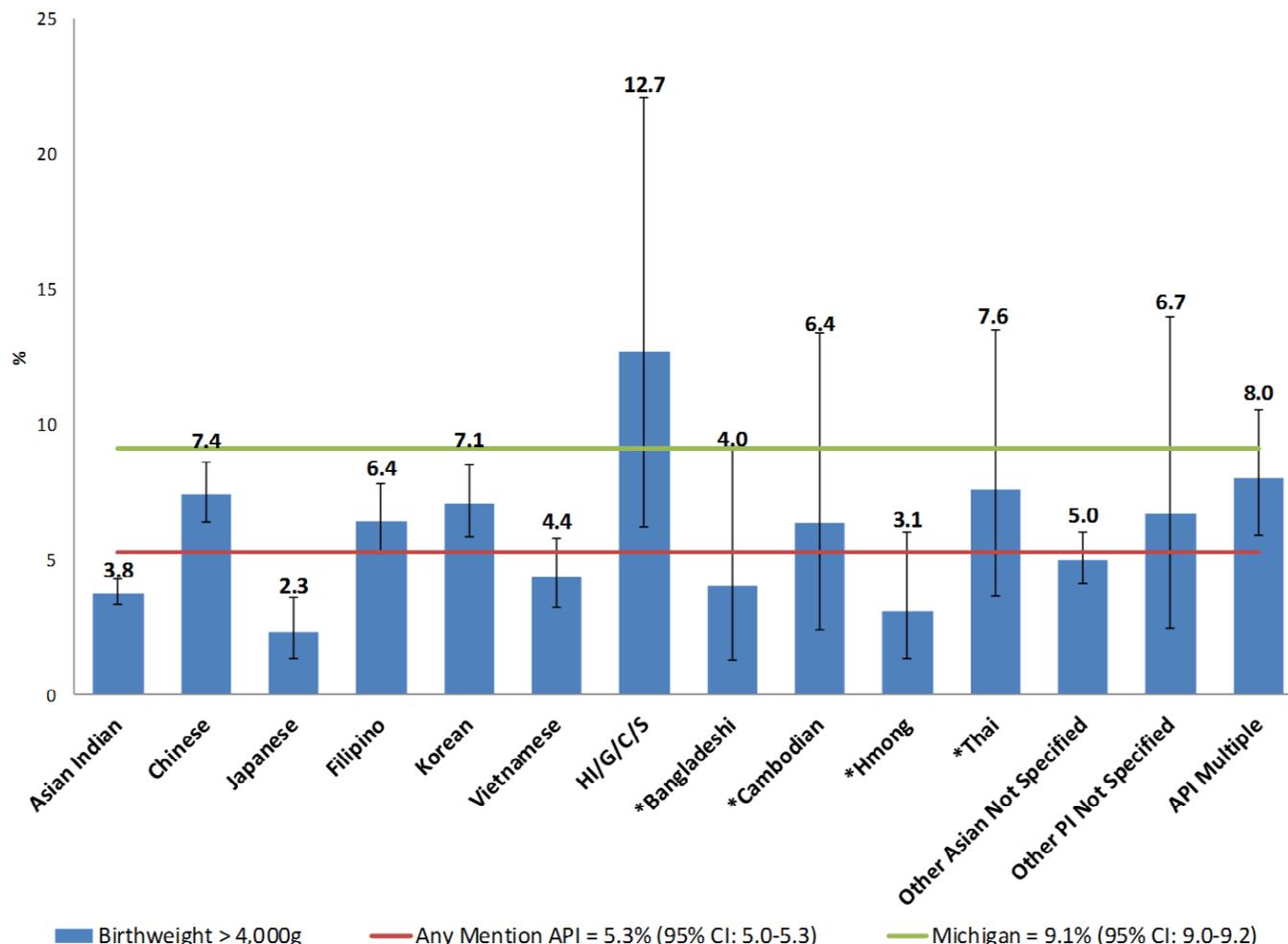
From 2009-2013, the overall API proportion of LBW was 3.5% (95% CI: 3.3-3.8). Though the confidence intervals are wide, there is a general pattern that new groups and uncategorizable groups had higher proportions than the overall API proportion. Laotian (5.9% [95% CI: 3.0-10.3]), Thai (3.8% [95% CI: 1.2-8.6]), Other Asian Not Specified (4.2% [95% CI: 3.4-5.1]), and Asian Multiple Race (3.8% [95% CI: 2.4-5.8]) groups each had proportions greater than the overall API proportion, although differences were not significant. Asian Indian (4.7% [95% CI: 4.2-5.2]) births were the only proportion to be significantly higher than the overall API proportion.

The overall Michigan proportion was 6.5% (95% CI: 6.5-6.6). NHW, NHB, and Hispanic proportions for this period were 5.13% (95% CI: 5.1-5.2), 11.8% (95% CI: 11.6-12.0), and 5.8% (95% CI: 5.6-6.1) respectively. Asian Indian, Japanese, Laotian, Thai, Other Asian Not Specified, and API Multiple Race groups had confidence intervals that overlapped with the NHW and Hispanic proportions.

Suppressed for Numerator < five or Denominator <50: Native Hawaiian/Guamanian/Chamorro, Bangladeshi, Burmese, Cambodian, Hmong, Indonesian/Malaysian, Pakistani/Bhutanese/Nepalese, Other Pacific Islander Not Specified. Limited to singleton, term births. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

High Birthweight

Percent of Mothers with High Birthweight Infants, Michigan, 2009-2013



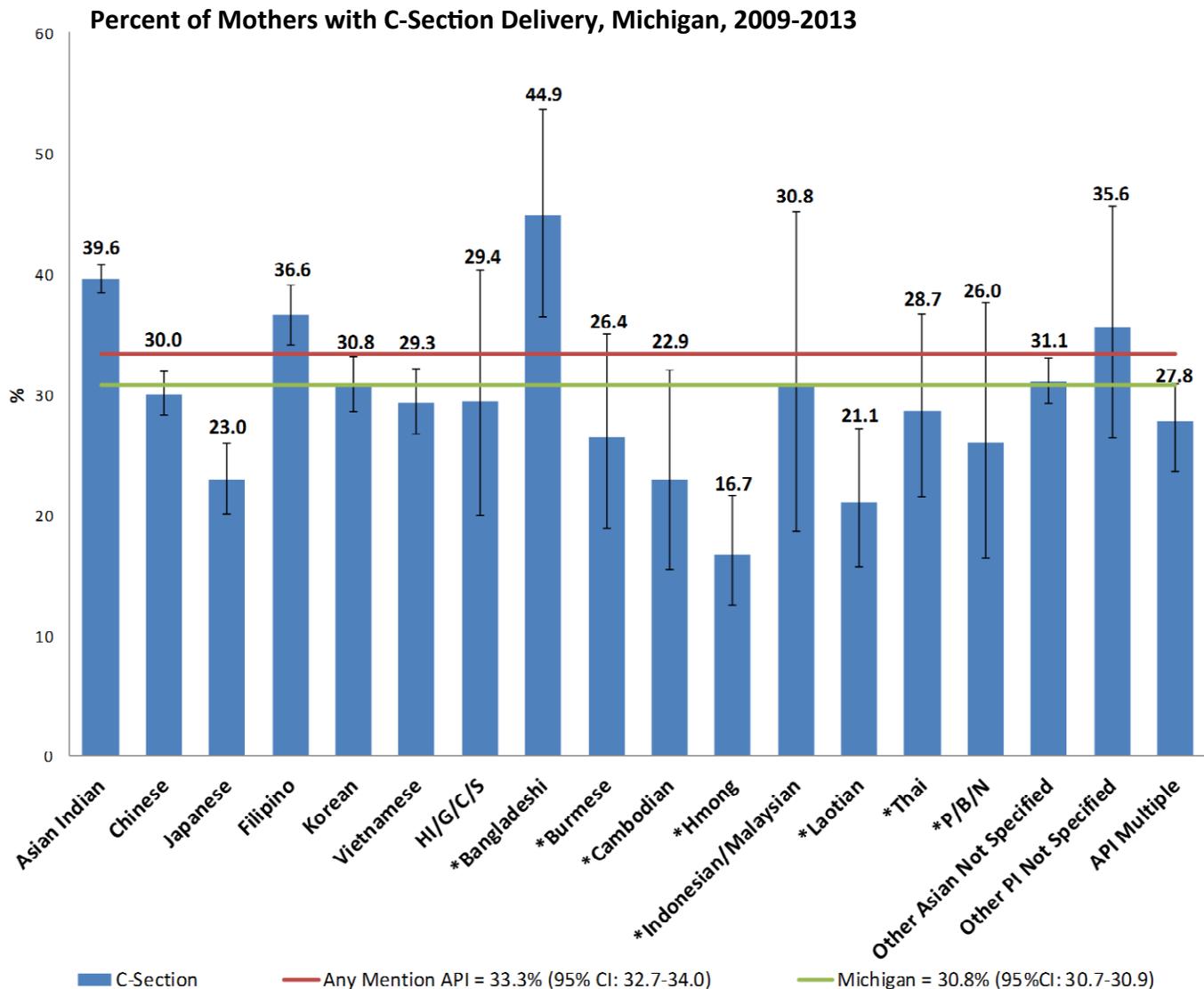
Birthweight higher than 4,000 grams is associated with increased risk of labor complications, birth injuries, neonatal morbidity, mortality, and long term health consequences like childhood obesity.³⁵⁻³⁶ Evidence suggests Asian American women may be at lower risk for HBW than NHW counterparts; there is little data about this outcome in Pacific Islanders.²⁵ HBW was defined as the proportion of singleton, term infants born weighing more than 4,000 grams within a specific race group, divided by the total number of singleton, term infants in that race group.

The overall proportion of HBW for API births between 2009 and 2013 was 5.3% (95% CI: 5.0-5.3). Many of the new and uncategorizable groups had lower proportions of HBW than the regularly reported groups. Chinese (7.4% [95% CI: 6.4-8.6]), Korean (7.1% [95% CI: 5.8-8.5]), and HI/G/C/S (12.7% [95% CI: 6.2-22.1]) experienced significantly higher proportions of HBW when compared to the overall API proportion. The API Multiple Race (8.0% [95% CI: 5.9-10.6]) group was the only uncategorizable group that had a significantly higher proportion than the overall API proportion; however, there were new and uncategorizable groups that had non-significant higher proportions, like the Cambodian (6.4% [95% CI: 2.4-13.4]) and the Thai (7.6% [95% CI: 3.7-13.5]) groups.

The overall Michigan proportion of HBW (9.1% [95% CI: 9.0-9.2]) was significantly higher than the overall API proportion. The overall API proportion was lower than the proportion for NHW (10.7% [95% CI: 10.6-10.8]) and Hispanic (8.6% [95% CI: 8.3-8.9]), but higher than the proportion for NHB (4.3% [95% CI: 4.2-4.4]).

Suppressed for Numerator < five or Denominator <50: Burmese, Indonesian/Malaysian, Laotian, Pakistani/Bhutanese/Nepalese. Limited to singleton, term births. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Final Method of Delivery: C-Section



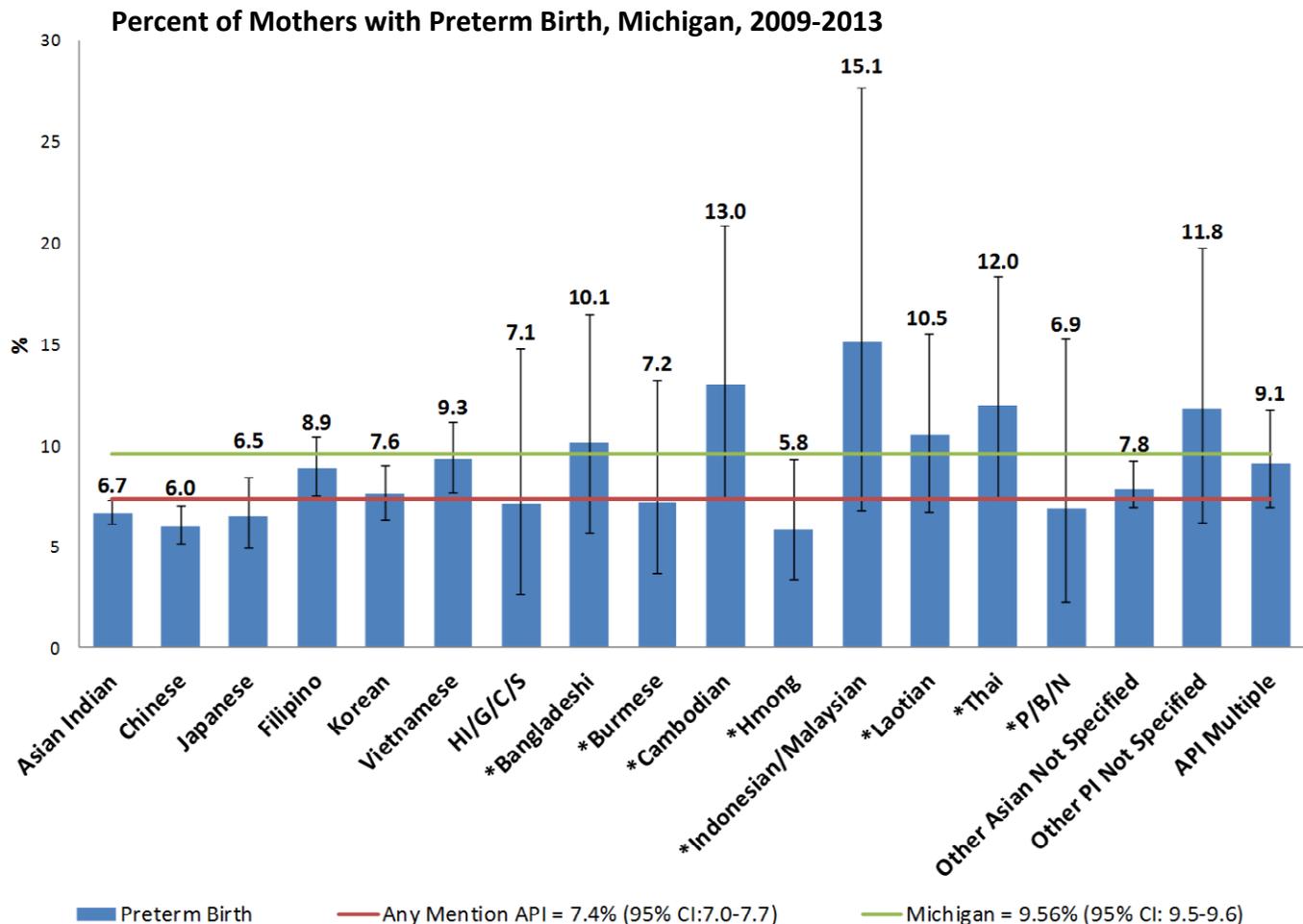
C-section delivery is associated with an increased risk of Neonatal Intensive Care Unit (NICU) admission, and other neonatal complications.³⁷ C-section deliveries are most commonly indicated when labor fails to progress as expected or the fetal heart rate appears compromised.³⁸ Evidence suggests Asian women experience a 50% increase in odds of delivery by C-section compared to NHW.³⁹ The C-section variable was defined as the proportion of births delivered via C-section within a race group, divided by the total number of births in that group.

From 2009-2013, the overall proportion API births delivered by C-section was 33.3% (95% CI: 32.7-34.0). The proportion across regularly reported groups, new groups, and uncategorizable groups varied widely. Asian Indian (39.6% [95% CI: 38.4-40.7]) and Filipino (36.6% [95% CI: 34.2-39.0]) mothers had a higher proportion of C-section delivery than the overall API proportion, as did Bangladeshi (44.9% [95% CI: 36.5-53.6]) mothers. Many new groups had significantly lower proportions of C-section delivery than the overall API proportion, such as Cambodian (22.9% [95% CI: 15.4-32.0]), Hmong (16.7% [95% CI: 12.5-21.7]), and Laotian (21.1% [95% CI: 15.7-27.2]), as did the Chinese, Japanese, Korean, and Vietnamese groups.

The overall API proportion was significantly higher than the overall Michigan proportion of C-section delivery (30.8% [95% CI: 30.7-30.9]). The overall API proportion was significantly higher than proportions for NHW (30.9% [95% CI: 30.7-31.0]), NHB (30.9% [95% CI: 30.6-31.2]), and Hispanic (28.8% [95% CI: 28.4-29.3]) groups.

Includes singleton, plural, and preterm births. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Preterm Birth

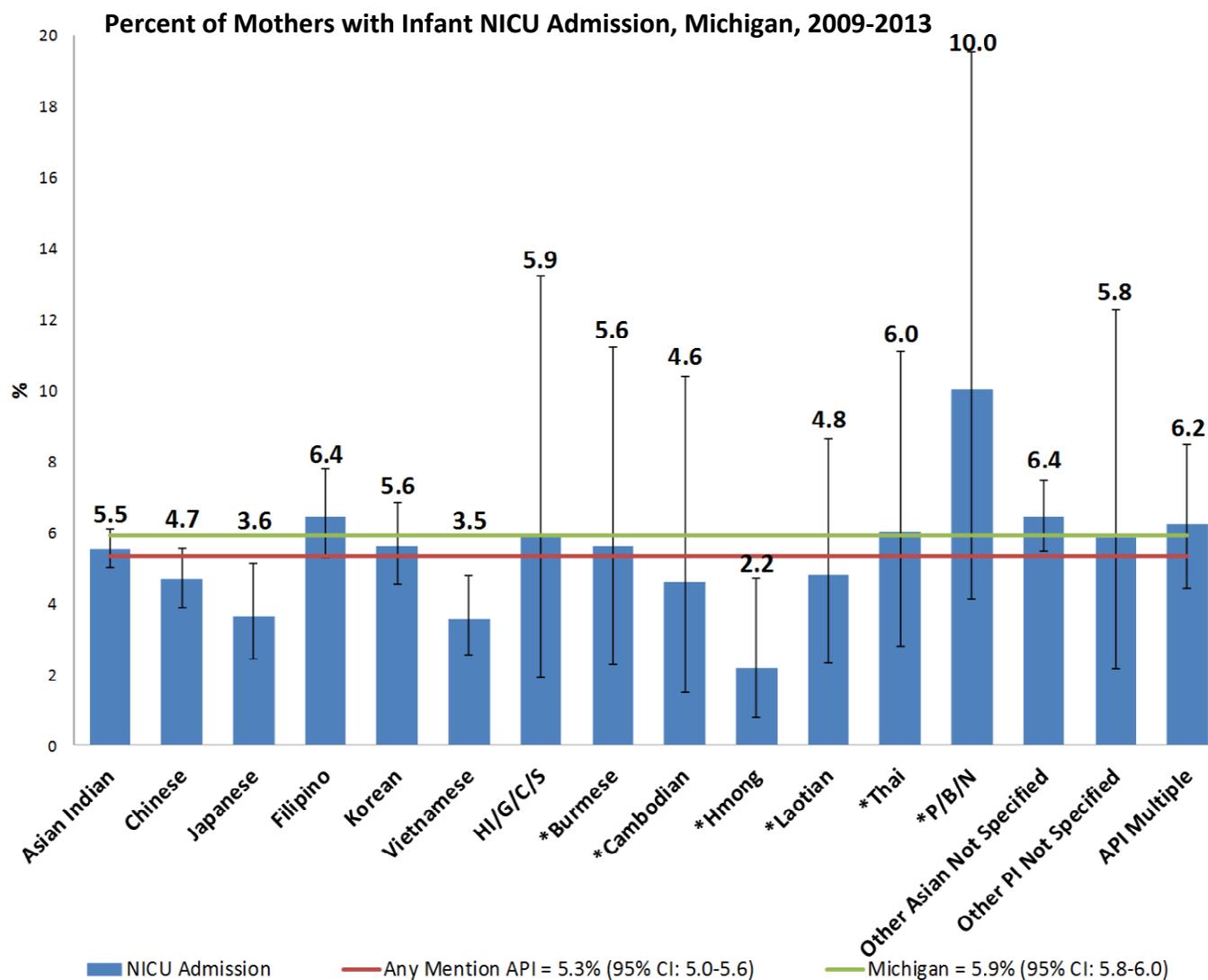


Preterm birth (PTB) is the leading risk factor for neonatal mortality worldwide, and is associated with admission to NICUs, and long-term health complications for survivors.²⁹ The Healthy People 2020 goal is to reduce the proportion of PTB in the US to 11.4%.⁹ The PTB variable was defined as the proportion of infants born prior to 37 weeks gestation within a specific race group, divided by the total number of infants in that race group.

From 2009-2013, the overall API proportion of PTB was 7.4% (95% CI: 7.0-7.7). The Cambodian (13.0% [95% CI: 7.3-20.8]) group was the only group with a statistically significantly higher proportion of PTB than the overall API proportion. Many groups had higher point estimates that did not reach significance. The Vietnamese group had a marginally significant higher proportion of PTB than the overall API population (9.3% [95% CI: 7.7-11.2]). Bangladeshi (10.1% [95% CI: 5.7-16.4]), Indonesian or Malaysian (15.1% [95% CI: 6.8-27.6]), Laotian (10.5% [95% CI: 6.7-15.5]), Thai (12.0% [95% CI: 7.3-18.3]), OPI Not Specified (11.8% [95% CI: 6.2-19.7]), and API Multiple Race groups had higher estimates, although not significant, than the overall API proportion.

The overall API proportion of PTB was lower than the overall Michigan proportion (9.56% [95% CI: 9.5-9.6]). While none of the new or uncategorizable groups' estimates reached statistical significance, some were still higher estimates than the state estimate, including Bangladeshi, Cambodian, Indonesian or Malaysian, Laotian, Thai, and Other Pacific Islander Not Specified. The overall API estimate of PTB was lower than NHW (8.1% [95% CI: 8.0-8.2]), NHB (15.0% [95% CI: 14.8-15.2]), and Hispanic (10.3% [95% CI: 9.9-10.6]) groups, but some of the groups had comparable estimates to Michigan's NHB proportion.

Neonatal Intensive Care Unit Admission



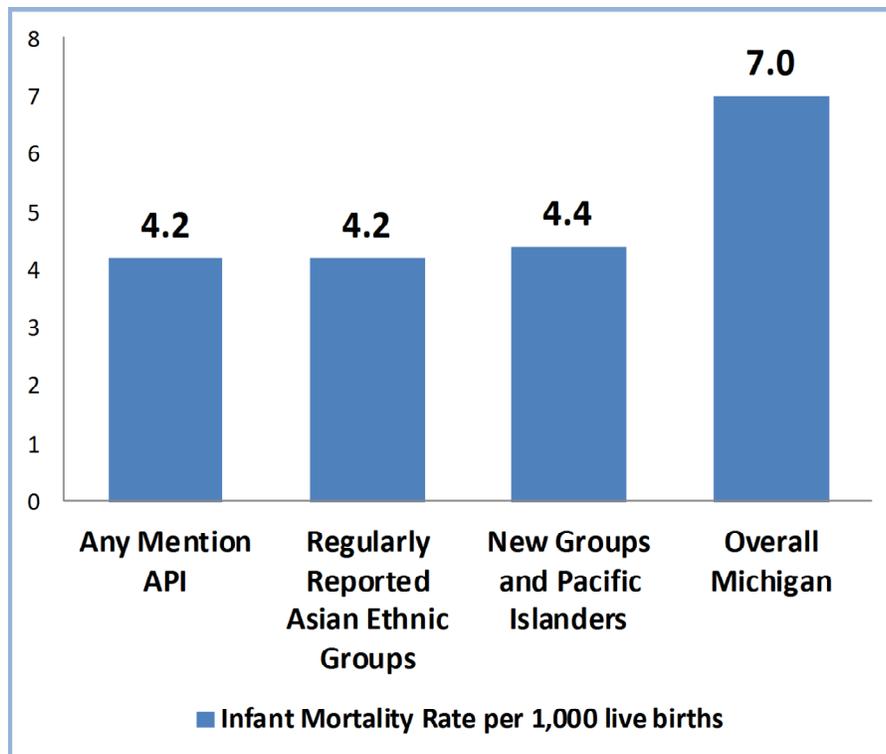
NICU admission is associated with labor and delivery complications, mode of delivery, and pregnancy disorders like gestational diabetes.⁴⁰ Neonates admitted to the NICU incur large hospital bills, are at higher risk for re-hospitalization, and are more likely to die than neonates who are not admitted.⁴¹ The NICU variable was defined as the proportion of neonates admitted to the NICU within a specific race group, divided by the total number of neonates in that race group.

From 2009-2013, the overall proportion of NICU admissions for API births was 5.3% (95% CI: 5.0-5.6). Due to small numbers of events, the confidence intervals for the small new and uncategorizable groups were wide; however, point estimates for Thai (6.0% [95% CI: 2.8-11.1]), P/B/N (10.0% [95% CI: 4.1-19.5]), Other Asian not Specified (6.4% [95% CI: 5.5-7.5]), OPI not specified (5.8% [95% CI: 2.2-12.3]), and API Multiple Race (6.2% [95% CI: 4.4-8.5]) groups were higher than that of the overall API proportion, although differences were not significant. Some groups had proportions that were lower than overall API, such as Japanese (3.6% [95% CI: 2.5-5.1]), Vietnamese (3.5% [95% CI: 2.5-4.8]), and Hmong (2.2% [95% CI: 0.8-4.7]).

The overall API proportion of NICU admissions was lower than the overall Michigan proportion (5.9% [95% CI: 5.8-6.0]). The overall API proportion overlapped with the NHW proportion (5.3% [95% CI: 5.2-5.3]), but was higher than the Hispanic proportion (4.6% [95% CI: 4.4-4.8]). The overall API proportion was lower than the NHB proportion (8.7% [95% CI: 8.5-8.9]).

Suppressed for Numerator < five or Denominator < 50: Bangladeshi, Indonesian/Malaysian. Includes singleton, plural, and preterm births. *Indicates a group identified by literal text. Data source: Michigan Resident Live Birth File, 2009-2013, DVRHS, MDHHS.

Five-Year Infant Mortality Rate, Michigan 2009-2013



The leading causes of infant mortality in the US include birth defects, PTB, LBW, and maternal pregnancy complications.³¹ The Healthy People 2020 goal is to reduce the infant mortality rate to 6.0 deaths per 1,000 live births.⁹ The infant mortality rate was defined as the number of deaths from time of birth to age one per 1,000 births within a specific group.

Due to small numbers of infant mortality, groups were combined accordingly: Asian Indian, Chinese, Japanese, Filipino, Korean and Vietnamese were included in the 'Regularly Reported Asian Races' category. Native Hawaiian/Guamanian or Chamorro/Samoan, Burmese, Cambodian, Hmong, Laotian, Thai, Pakistani, Indonesian or Malaysian, Other Asian Not Specified, Other Pacific Islander Not Specified, and API Multiple race were included in the 'New Groups and Pacific Islanders' category.

From 2009-2013, there was no significant differences in the infant mortality rates when the New Groups and Pacific Islanders category (4.4 per 10,00 live births) was compared to the Regularly Reported Asian category (4.2 per 1,000 live births), and the overall API rate (4.2 per 1,000 live births). The rates for API groups was lower than the overall Michigan rate of 7.0 per 1,000 live births from 2009-2013. For NHW, the rate stayed around 5.2 per 1,000 live births. For NHB, the five year infant mortality rate was 14.0, with rates falling from 15.7 per 1,000 live births in 2009 to 12.6 per 1,000 live births in 2013.⁴² It is important to note that the above groupings may mask disparities. More years of data for the API group could be examined to look at trends in infant mortality, and may allow for refined categories for the API groups.

Conclusions

This project highlighted several key issues that arise when examining the health status of Asian and Pacific Islanders in Michigan.

- ◆ **The API populations in Michigan are diverse.**

Asian Indian is the largest API ethnic group in Michigan. Between 2009 and 2013, births to mothers of regularly reported groups such as Asian Indian, Chinese, Korean, and Filipino, comprised about 75% of all API births statewide. However, API ethnic groups who are typically unreported or uncategorizable into a country of origin still contribute a sizeable proportion of births in Michigan. There are a growing number of births to Hmong, Bangladeshi, Cambodian, and Laotian mothers. Traditionally unreported groups are often categorized as Other Asian or Other Pacific Islander, or they are categorized in one of the larger, traditionally reported groups, such as Asian Indian or Chinese. Examining data by specific API ethnic group is important for understanding the variability within the populations.

- ◆ **There is large variation in health status between API ethnic groups.**

Many of the maternal demographics and pregnancy characteristics for the smaller ethnic groups, particularly Hmong, Laotian, Bangladeshi, and Burmese, varied significantly from the regularly reported Asian groups and overall API group. More mothers in these smaller groups were unmarried, had not graduated from high school, intended to use Medicaid as payment for birth, and did not receive PNC in the first trimester of pregnancy than the overall API population. The Vietnamese group also had similar results, not following the pattern of regularly reported groups. The Pacific Islander groups (reported and uncategorized) as well as the uncategorizable Asian group and API multiple race also varied significantly from the regularly reported Asian groups.

- ◆ **Grouping API populations together masks health-related indicators in small groups.**

Although many of the smaller API ethnic groups had worse maternal demographics and pregnancy characteristics, these groups are smaller in size and their differences are not well accounted for when all API groups are reported together. For example, even though the Bangladeshi and Burmese groups reported significantly higher Medicaid payment than Michigan overall, the larger groups (e.g. Asian Indian, Chinese, Japanese) reported significantly lower Medicaid estimates, thus allowing the overall API estimate to stay below the Michigan estimate. Although there is convenience with combining the smaller API ethnic groups together or combining Pacific Islanders with Asians, these methods mask important health disparities.

Conclusions (Continued)

◆ Health indicators related to social and economic status are important to consider.

From 2009-2013, the greatest disparities in pregnancy and child health for Michigan's API population were reflected in indicators that were related to the social and economic positions of the mothers. These included maternal age of less than 20 years, marriage status at the time of birth, education less than high school for mothers 20 years of age and older, Medicaid as the intended payment for the birth, and initiation of PNC in the first trimester. Addressing these disparities requires an understanding and examination of the potential root causes that may play a role in these outcomes. In spite of the differences found for social and economic indicators, pregnancy outcomes in these groups did not appear to differ from the overall API outcomes. This raises the possibility of a paradox⁴³ within Michigan's API population, making this an important direction for future work.

◆ Stereotypes of API persons are unhelpful in health care settings.

Stereotypes of API persons often assert that API persons are mentally and physically healthier, and earn higher incomes than other Americans.⁴⁴ This report demonstrated that health and socioeconomic disparities exist both within Michigan's API population and between the API population and Michigan's overall population. For example, from 2009-2013, Michigan's API population had higher proportions of GDM, inadequate gestational weight gain, and C-section deliveries than the overall Michigan proportion. Traditional risk factors and standard cut points may not apply for all API ethnic groups and health care providers should be aware of these differences.⁴⁵ The application of stereotypes, even inadvertently, may prevent API persons from receiving health care that meets national standards for cultural and linguistic appropriateness⁴⁶ during pregnancy, and are inappropriate in any public health or health care setting.

◆ Improved data collection and recording is necessary to address health disparities.

Better data for the Michigan API populations are necessary to improve health outcomes. This project was a first step in understanding health disparities within the API populations in Michigan. This was not intended as an analytic report, but provides a launching point for addressing health disparities that exist within a group typically considered to be better off in terms of health. Improvement in the recording of the write-in categories of "Other Asian" and "Other Pacific Islander" categories on the Michigan birth certificate is necessary for continued improvement in the ongoing public health surveillance of these populations. Further data linkages and utilizing more years of data would allow for more indicators by specific group to have larger sample sizes.

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HDRMHS Asian and Pacific Islander Data Advisory Committee including:

Dr. Janilla Lee – The University of Michigan

Mahima Mahadevan – The University of Michigan

Dr. Tsu-Yin Wu – Eastern Michigan University

Data Source and Methods

Michigan's Department of Vital Records and Health Statistics (DVRHS) registers each birth that occurs to women who are residents of the state. The Michigan Certificate of Live Birth collects data that include birth information, parental information, and pregnancy information. These data can be used for public health surveillance; important data that are collected include birthweight, gestational age, pregnancy complications like gestational diabetes mellitus, and maternal demographics such as age, race/ethnicity, and education. The birth certificate also identifies infants who were born as singletons, twins, triplets, and so on.

Parents are allowed to report up to five races on the birth certificate. In the instances where the parents report "Other Asian" or "Other Race", the birth certificate allows for a written-in specification of what the race is (referred to as "Literal Text" from here forward). Literal text ethnicities were manually checked for spelling and standardized. All race data are then sent to the National Center for Health Statistics (NCHS), and a Bridged Race category is assigned. The Bridged Race algorithm uses a complex set of variables to determine a single race category (NHW, NHB, Hispanic, API, American Indian or Alaska Native) that best fits an observation when more than one race is selected, as defined by the Office of Management and Budget.⁴⁷

The dataset used for this analysis contained only records for the births of Michigan resident women who reported any API race on the birth certificate. Five race variables were available for determination of maternal race: the Bridged Race category created by NCHS, and four alternative race categories. In this dataset, Bridged Race took the place of the primary self-reported race. Alternative races were self-reported on the birth certificate. Records whose mothers reported a literal text not typically captured by the Bridged Race categories were assigned a primary race of the literal text group*. Women who did not report a literal text category, or whose category matched that of a pre-specified Bridged Race group retained the Bridged Race category as their primary race.

For indicators related to maternal and pregnancy characteristics, plural births were allowed to remain in the dataset; however, only the first birth record was used to avoid double-counting the mother. For birth outcomes, singleton births only were used, due to many of the outcomes being strongly tied to plurality.

Of note: birth certificate data are considered census data; in theory, it is 100% complete.⁴⁸ We use 95% confidence intervals for determining statistical significance, but census data suggests that any difference that is apparent is real regardless of statistical significance.

Limitations: Birth certificate data are limited by the quality of data entered at the time of birth. The analytic dataset did not contain unique identifiers for parents; therefore, it was impossible to identify births clustered by parents. The variance of some of the estimates may be underestimated as a result.

State/country of birth was not available for the parents in the analytic dataset, so analysis based on immigration status was not possible.

Observations with missing variable information were excluded only for the variable that was missing.

*For literal text groups with a size of less than 10, Bridged Race was maintained to avoid problems with small numbers. Literal text groups with an n between 20 and 50 were collapsed to one group. This group included mothers who indicated Pakistani, Bhutanese, or Nepalese on the birth certificate; most of these mothers would have been absorbed into the Asian Indian category, and we felt that it was important to maintain them as distinct.

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