

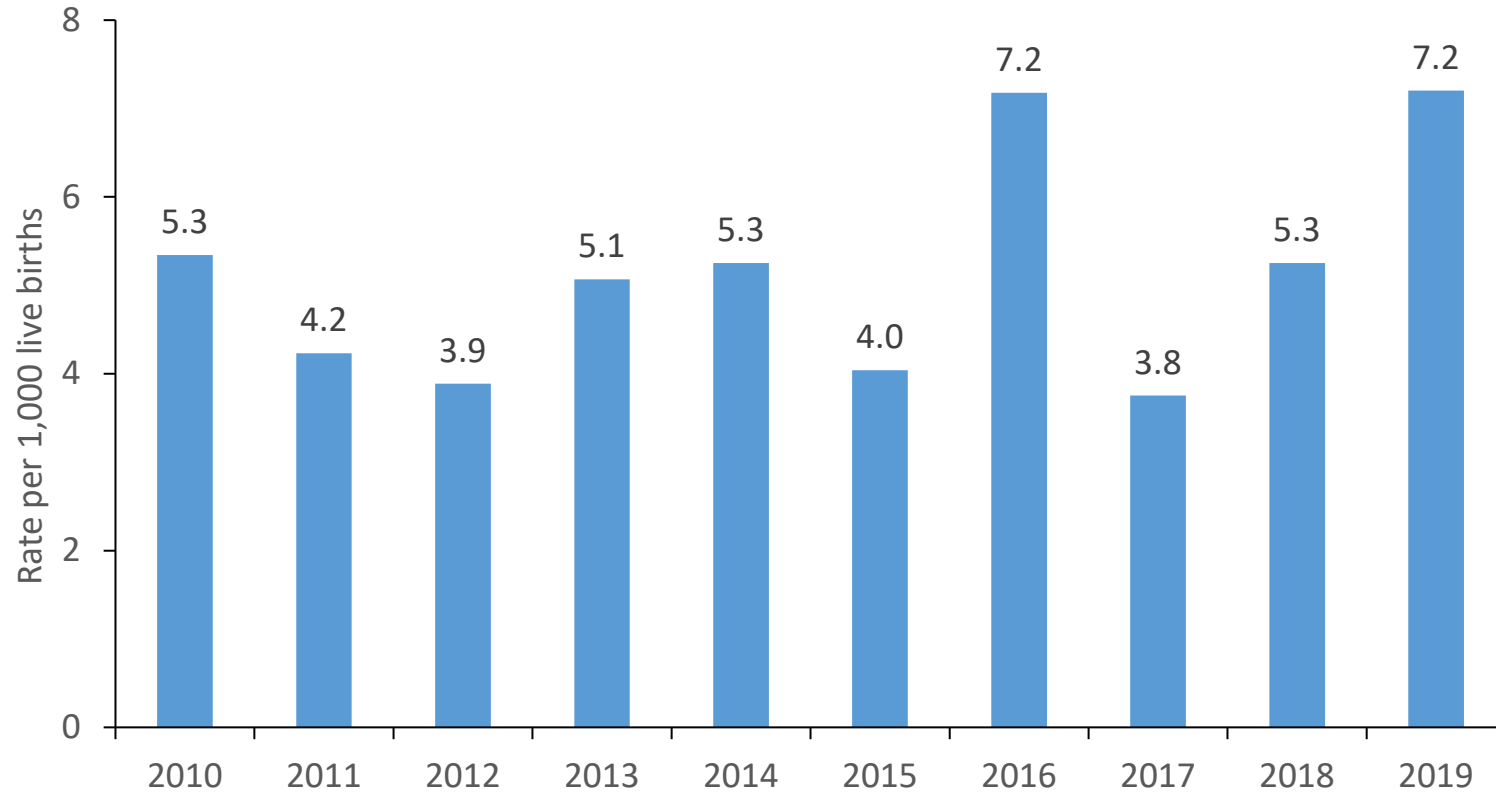
# Maternal and Infant Health Statistics, Prosperity Region 1, Michigan

Prepared by Maternal and Child Health (MCH) Epidemiology Section,  
Michigan Department of Health and Human Services (MDHHS)  
Data source: Michigan resident live birth files (09/18/2020) and infant mortality files (02/18/2021),  
Division for Vital Records and Health Statistics, MDHHS  
June 2021

# Infant Mortality Rate (IMR), Prosperity Region 1, 2010-2019

# Infant Mortality Rate, Prosperity Region 1, 2010-2019

(rate per 1,000 live births)

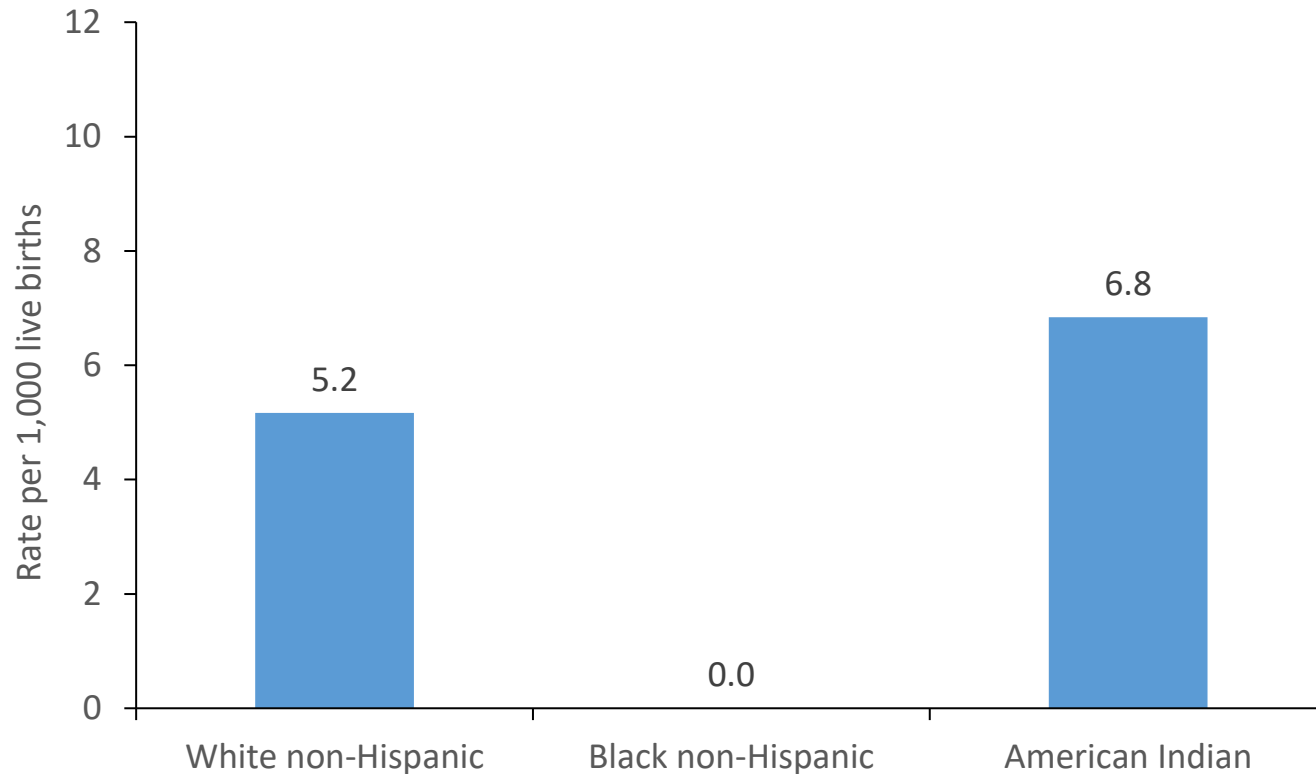


2019 Michigan Rate = 6.4

| Year | # Live Births | # Infant Death | IMR |
|------|---------------|----------------|-----|
| 2010 | 2,807         | 15             | 5.3 |
| 2011 | 2,835         | 12             | 4.2 |
| 2012 | 2,829         | 11             | 3.9 |
| 2013 | 2,763         | 14             | 5.1 |
| 2014 | 2,856         | 15             | 5.3 |
| 2015 | 2,723         | 11             | 4.0 |
| 2016 | 2,786         | 20             | 7.2 |
| 2017 | 2,665         | 10             | 3.8 |
| 2018 | 2,666         | 14             | 5.3 |
| 2019 | 2,499         | 18             | 7.2 |

Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.

# Infant Mortality Rates by Maternal Race/Ethnicity, Prosperity Region 1, 2015-2019 (rate per 1,000 live births)



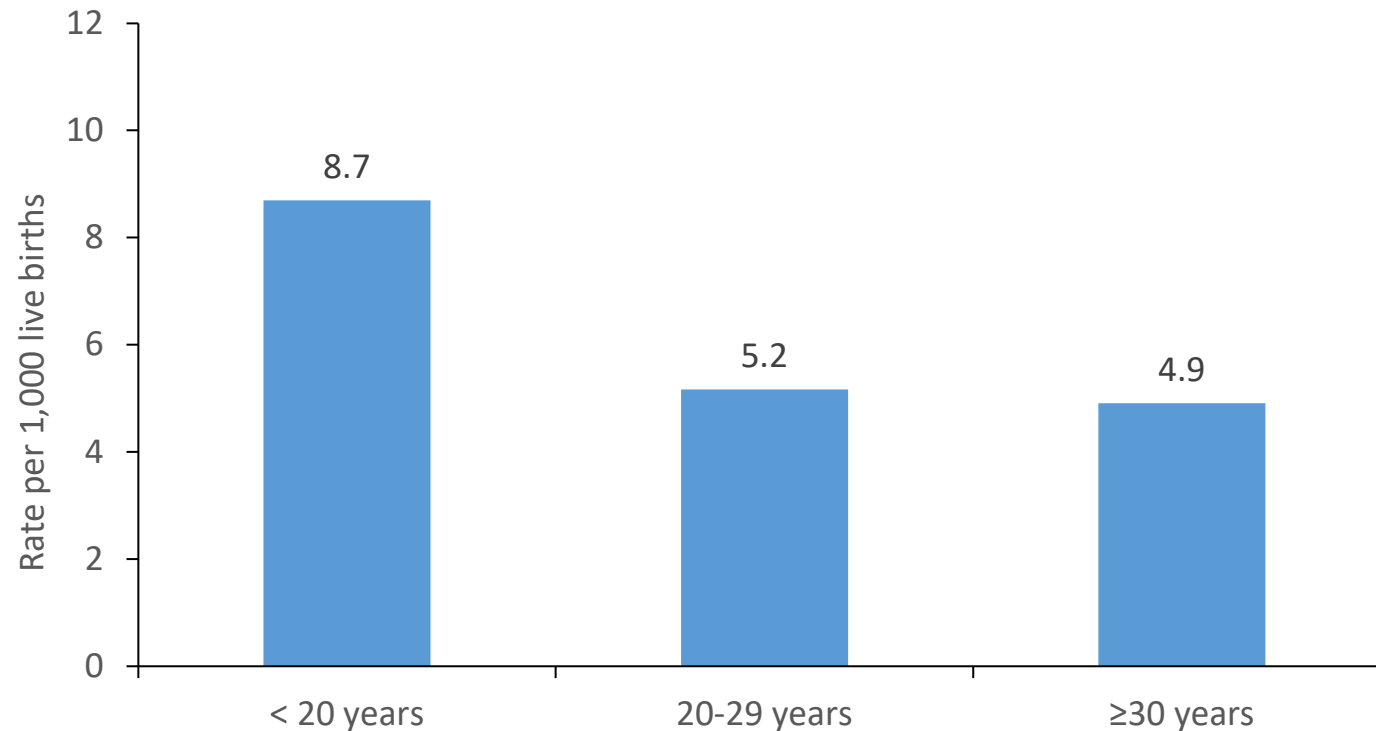
| Maternal Race/Ethnicity | # Live Births | # Infant Death | IMR |
|-------------------------|---------------|----------------|-----|
| White non-Hispanic      | 11,419        | 56             | 4.7 |
| Black non-Hispanic      | 69            | 0              | 0.0 |
| Hispanic                | 266           | DNS            | DNS |
| American Indian         | 877           | 6              | 6.8 |
| Asian/Pacific Islander  | 150           | DNS            | DNS |

DNS: data not sufficient (0<N<6).

2015-2019 Michigan Rates  
 White, nH = 4.9  
 Black, nH = 13.4  
 American Indian = 5.4

Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.

# Infant Mortality Rates by Maternal Age, Prosperity Region 1, 2015-2019 (rate per 1,000 live births)

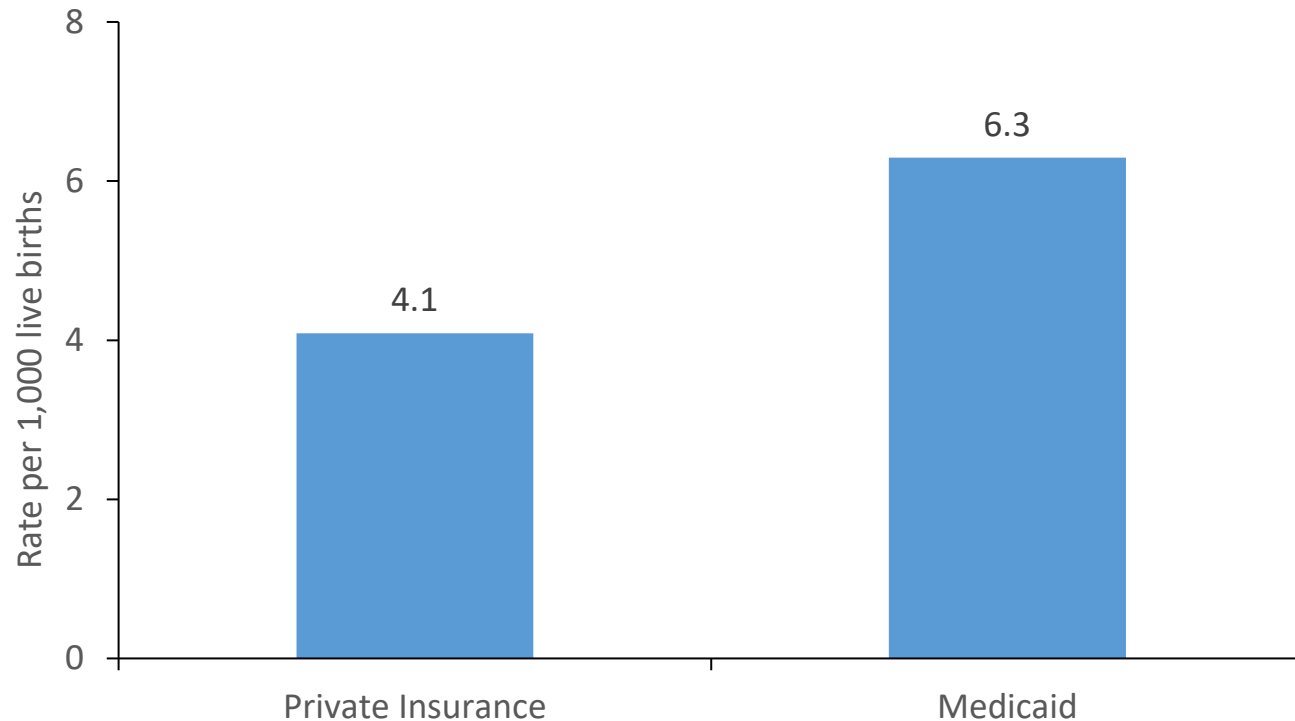


| Maternal Age | # Live Births | # Infant Death | IMR |
|--------------|---------------|----------------|-----|
| < 20 years   | 690           | 6              | 8.7 |
| 20-29 years  | 7,353         | 38             | 5.2 |
| ≥30 years    | 5,295         | 26             | 4.9 |

2015-2019 Michigan Rates  
 < 20 years = 10.0  
 20-29 years = 7.1  
 ≥30 years = 5.6

Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.

# Infant Mortality Rates by Intended Payment Source, Prosperity Region 1, 2015-2019 (rate per 1,000 live births)

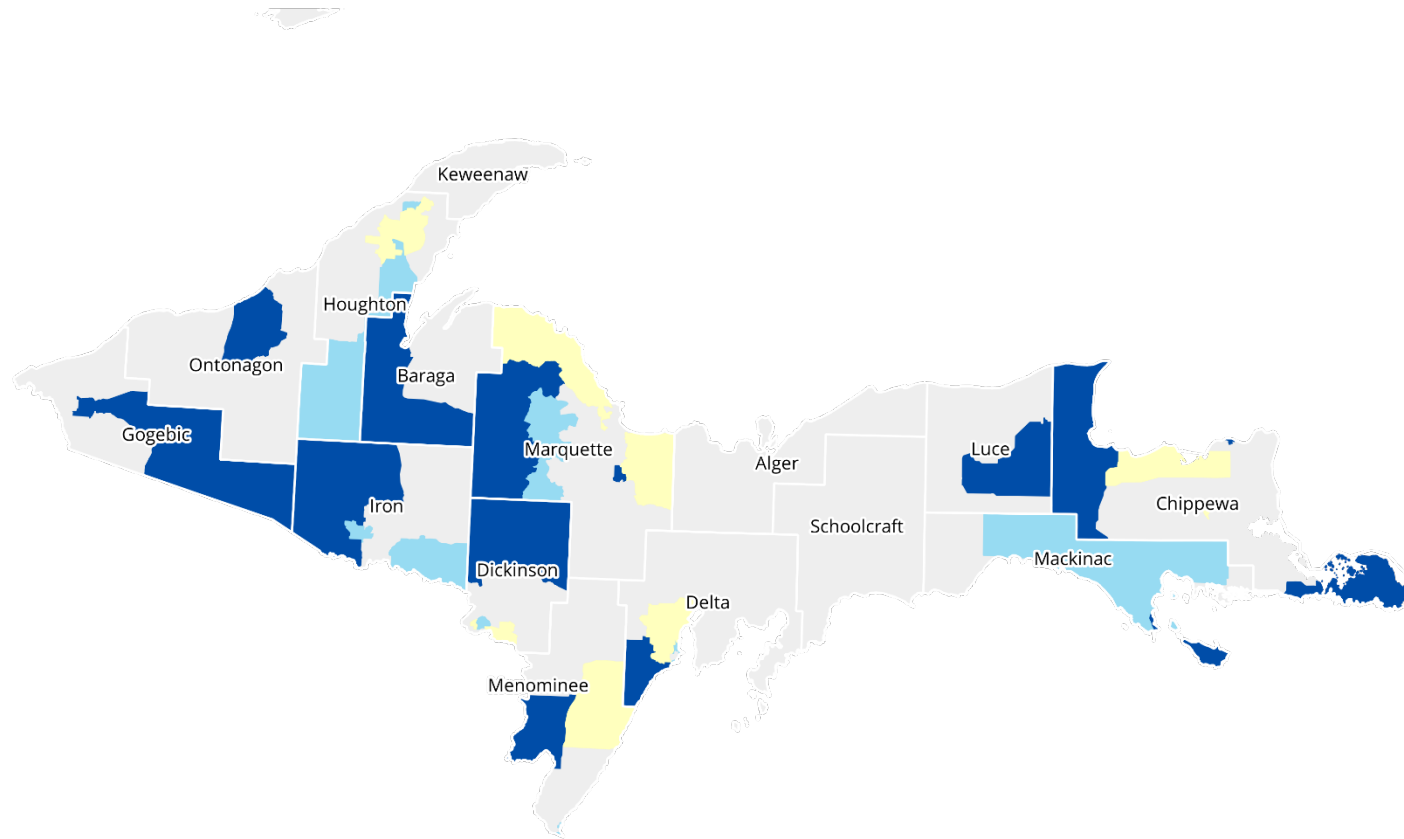


| Payment Source    | # Live Births | # Infant Death | IMR |
|-------------------|---------------|----------------|-----|
| Private Insurance | 6,364         | 26             | 4.1 |
| Medicaid          | 6,354         | 40             | 6.3 |

2015-2019 Michigan Rates  
 Private Insurance = 4.8  
 Medicaid = 8.8

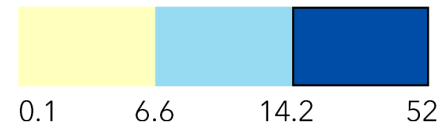
Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.

# Infant Mortality Rate by Census Tract Prosperity Region 1, 2014-2018



## Infant Deaths per 1,000 Live Births

Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.



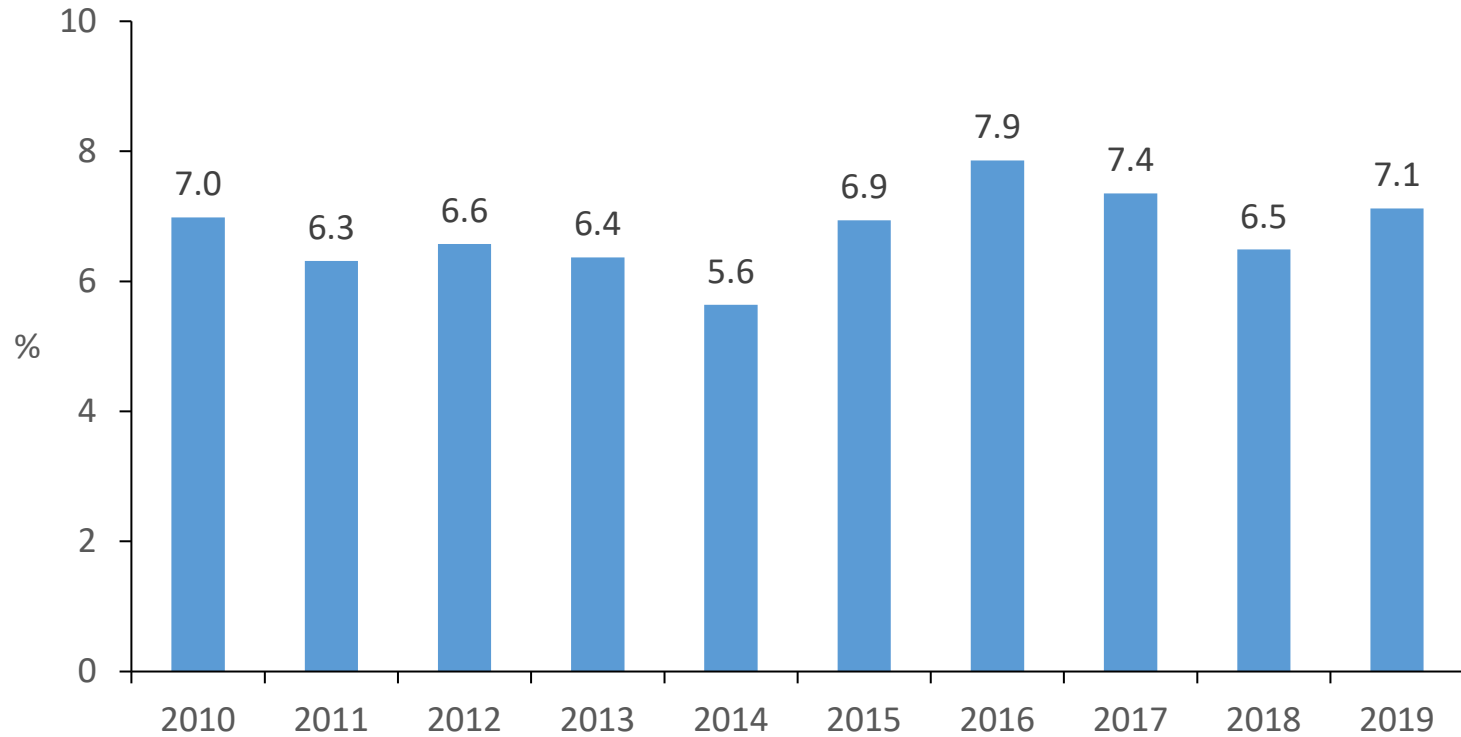
No Live Births/Infant Deaths

# Low Birthweight (LBW), Prosperity Region 1, 2010-2019



# Low Birthweight (Birthweight <2,500 Grams), Prosperity Region 1, 2010-2019

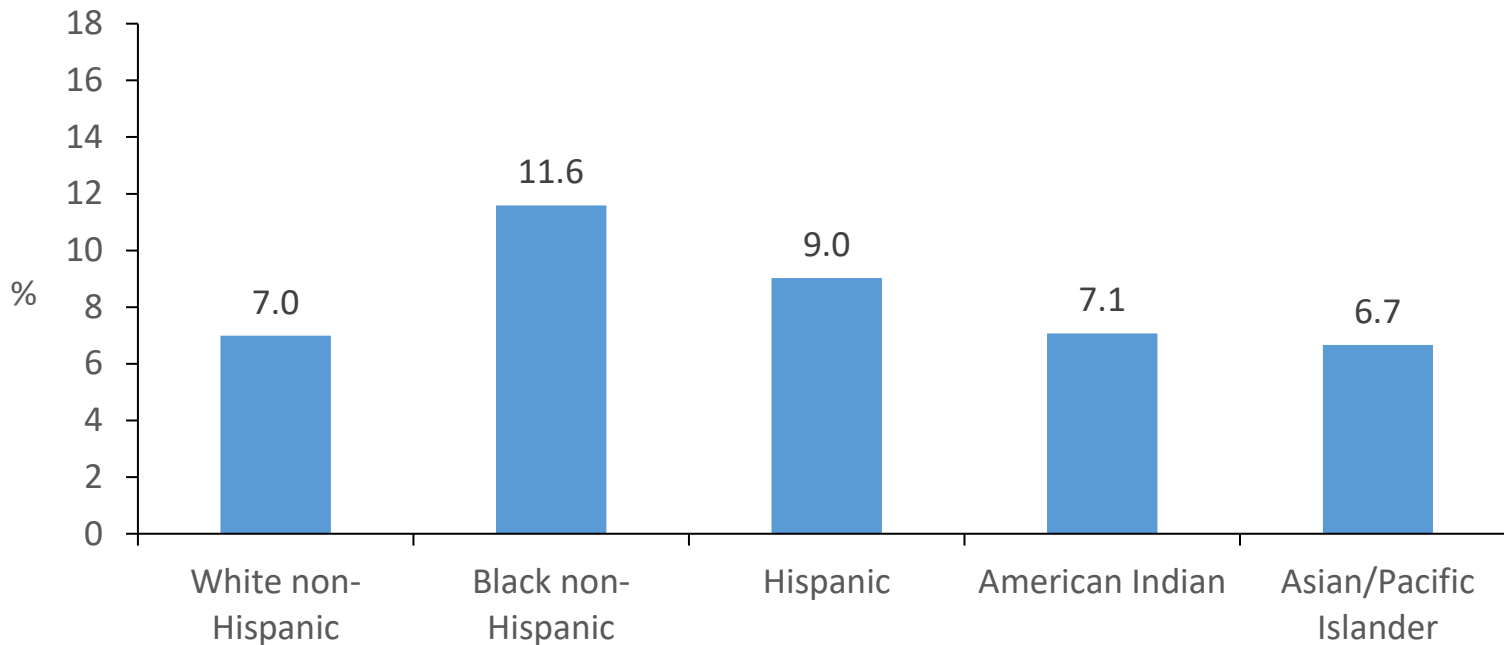
2019 Michigan Percent = 8.8



| Year | # Live Births | # LBW | LBW % |
|------|---------------|-------|-------|
| 2010 | 2,807         | 196   | 7.0   |
| 2011 | 2,835         | 179   | 6.3   |
| 2012 | 2,829         | 186   | 6.6   |
| 2013 | 2,763         | 176   | 6.4   |
| 2014 | 2,856         | 161   | 5.6   |
| 2015 | 2,723         | 189   | 6.9   |
| 2016 | 2,786         | 219   | 7.9   |
| 2017 | 2,665         | 196   | 7.4   |
| 2018 | 2,666         | 173   | 6.5   |
| 2019 | 2,499         | 178   | 7.1   |

Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.

# Low Birthweight (Birthweight <2,500 Grams) by Maternal Race/Ethnicity, Prosperity Region 1, 2015-2019



| Maternal Race/Ethnicity | # Live Births | # LBW | LBW % |
|-------------------------|---------------|-------|-------|
| White non-Hispanic      | 11,419        | 798   | 7.0   |
| Black non-Hispanic      | 69            | 8     | 11.6  |
| Hispanic                | 266           | 24    | 9.0   |
| American Indian         | 877           | 62    | 7.1   |
| Asian/Pacific Islander  | 150           | 10    | 6.7   |

### 2015-2019 Michigan Percentages

White, nH = 7.0

Black, nH = 14.8

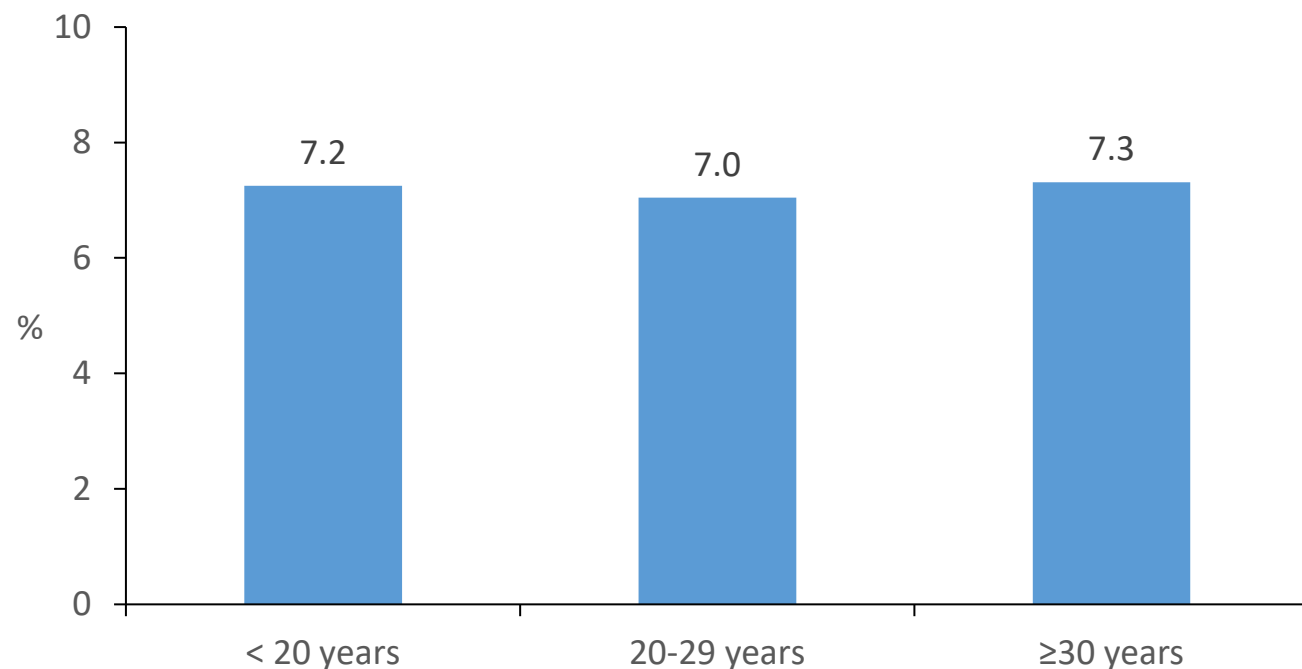
Hispanic = 7.5

American Indian = 8.8

Asian/Pacific Islander = 8.1

Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.

# Low Birthweight (Birthweight <2,500 Grams) by Maternal Age, Prosperity Region 1, 2015-2019

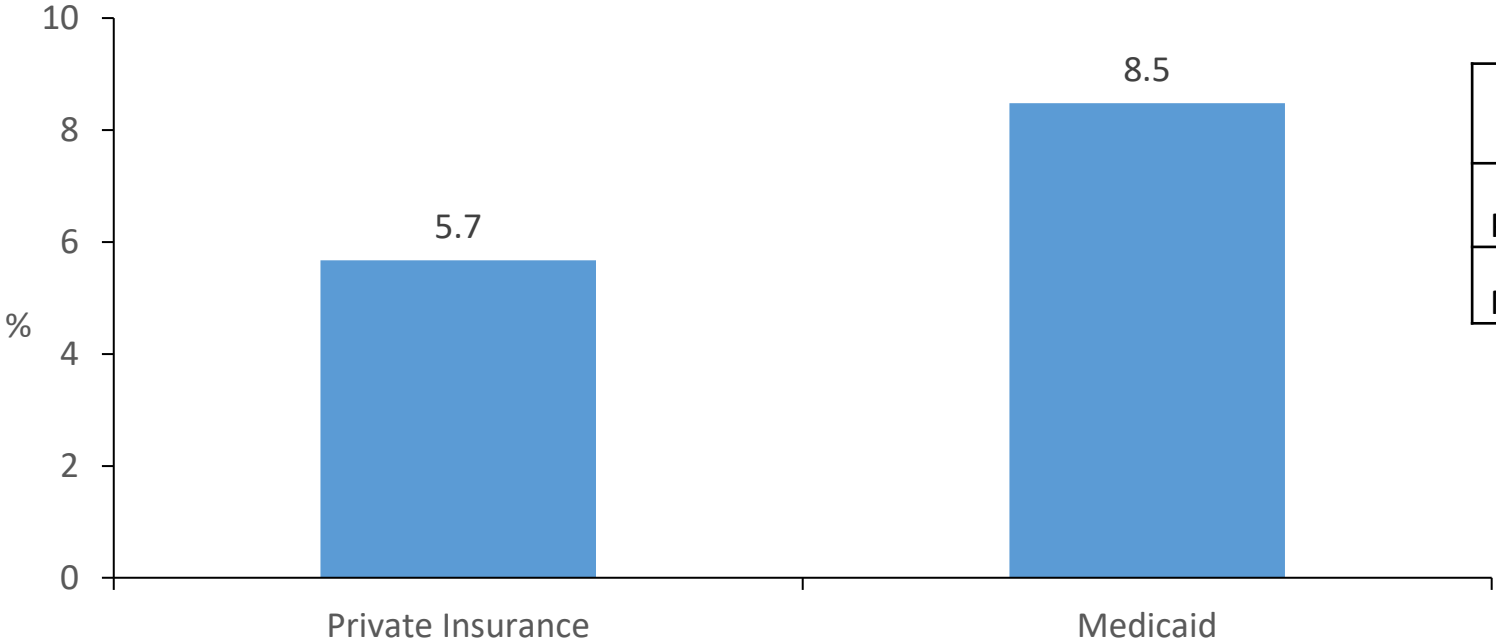


| Maternal Age | # Live Births | # LBW | LBW % |
|--------------|---------------|-------|-------|
| < 20 years   | 690           | 50    | 7.2   |
| 20-29 years  | 7,353         | 518   | 7.0   |
| ≥30 years    | 5,295         | 387   | 7.3   |

2015-2019 Michigan Percentages  
 < 20 years = 10.7  
 20-29 years = 8.5  
 ≥30 years = 8.5

Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.

# Low Birthweight (Birthweight <2,500 Grams) by Intended Payment Source, Prosperity Region 1, 2015-2019

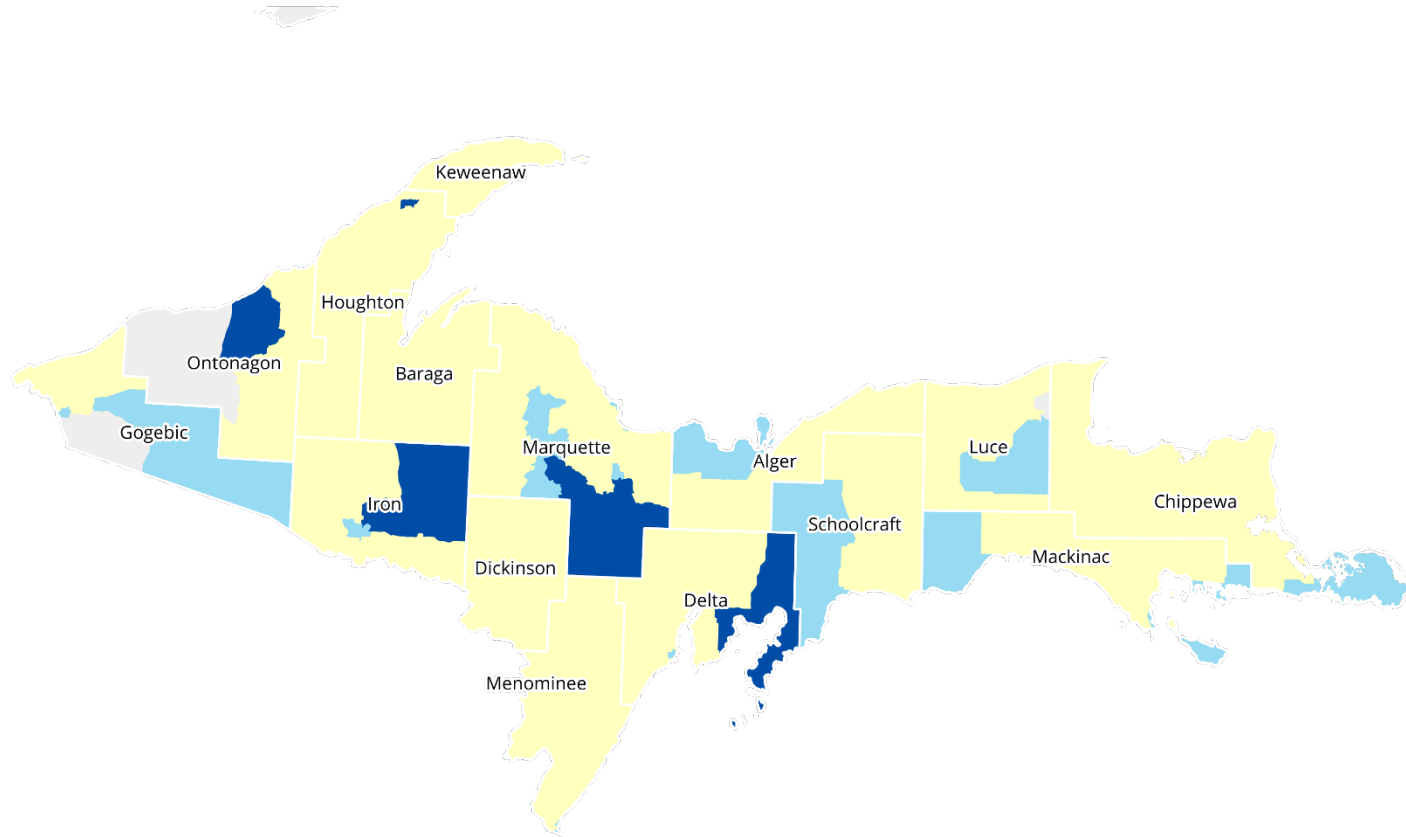


| Payment Source    | # Live Births | # LBW | LBW % |
|-------------------|---------------|-------|-------|
| Private Insurance | 6,364         | 361   | 5.7   |
| Medicaid          | 6,354         | 539   | 8.5   |

2015-2019 Michigan Percentages  
 Private Insurance = 7.2  
 Medicaid = 10.5

Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.

# Low Birthweight by Census Tract Prosperity Region 1, 2014-2018



## Percent Low Birthweight

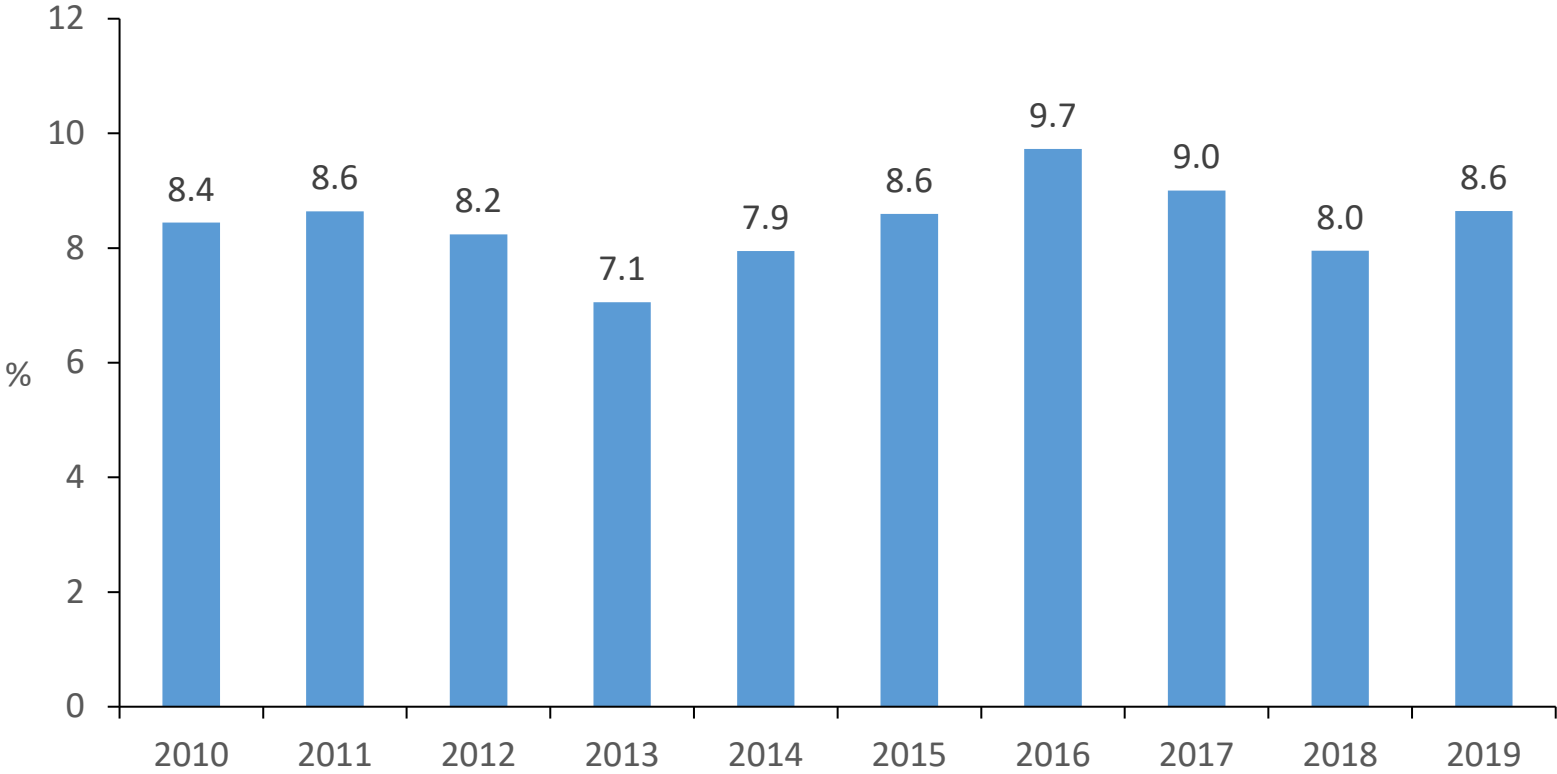
Low birthweight rate is defined as number of births with baby birthweight less than 5.5lbs (<2,500 grams) per 100 live births.



No Live Births/Low Birthweight Births

# Preterm Birth (PTB), Prosperity Region 1, 2010-2019

# Preterm Birth (Estimated Gestational Age <37 Weeks), Prosperity Region 1, 2010-2019

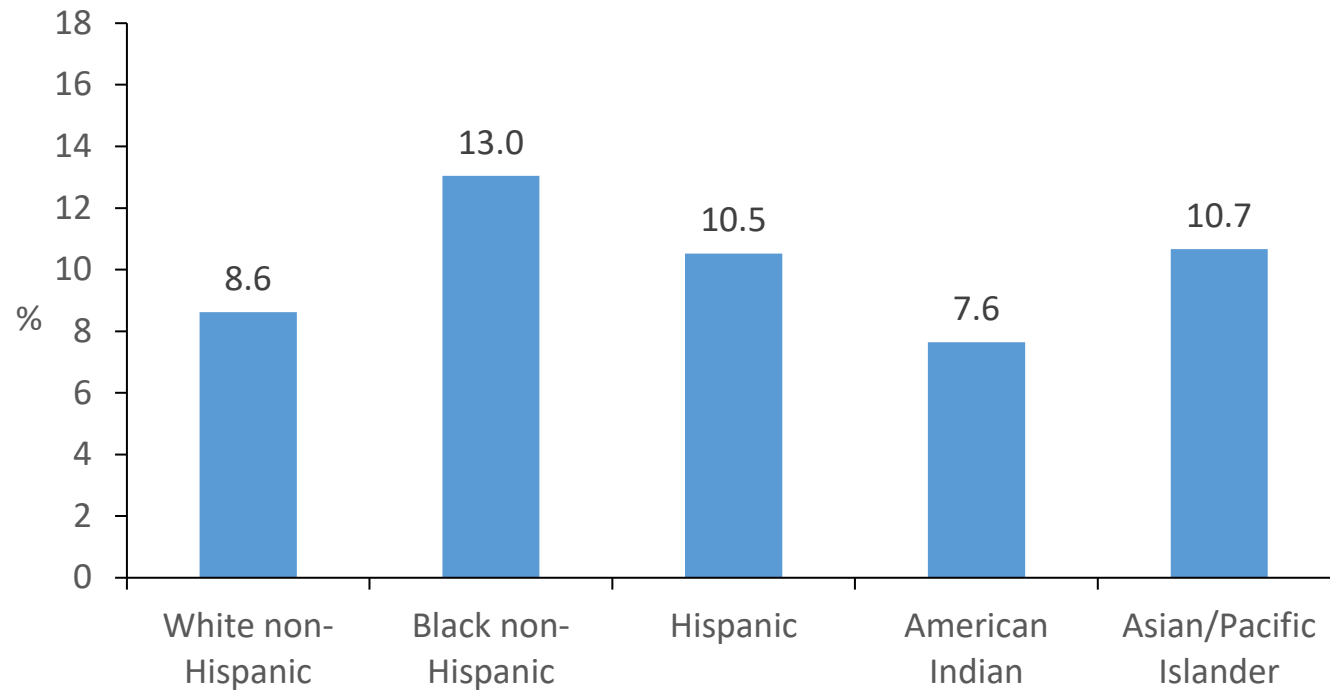


2019 Michigan Percent = 10.3

| Year | # Live Births | # PTB | PTB % |
|------|---------------|-------|-------|
| 2010 | 2,807         | 237   | 8.4   |
| 2011 | 2,835         | 245   | 8.6   |
| 2012 | 2,829         | 233   | 8.2   |
| 2013 | 2,763         | 195   | 7.1   |
| 2014 | 2,856         | 227   | 7.9   |
| 2015 | 2,723         | 234   | 8.6   |
| 2016 | 2,786         | 271   | 9.7   |
| 2017 | 2,665         | 240   | 9.0   |
| 2018 | 2,666         | 212   | 8.0   |
| 2019 | 2,499         | 216   | 8.6   |

Preterm birth rate is defined as number of births delivered before 37 completed weeks of gestation per 100 live births. Gestational age is based on the obstetric estimate of gestation.

# Preterm Birth (Estimated Gestational Age <37 Weeks) by Maternal Race/Ethnicity, Prosperity Region 1, 2015-2019



| Maternal Race/Ethnicity | # Live Births | # PTB | PTB % |
|-------------------------|---------------|-------|-------|
| White non-Hispanic      | 11,419        | 984   | 8.6   |
| Black non-Hispanic      | 69            | 9     | 13.0  |
| Hispanic                | 266           | 28    | 10.5  |
| American Indian         | 877           | 67    | 7.6   |
| Asian/Pacific Islander  | 150           | 16    | 10.7  |

## 2015-2019 Michigan Percentages

White, nH = 9.0

Black, nH = 14.6

Hispanic = 9.4

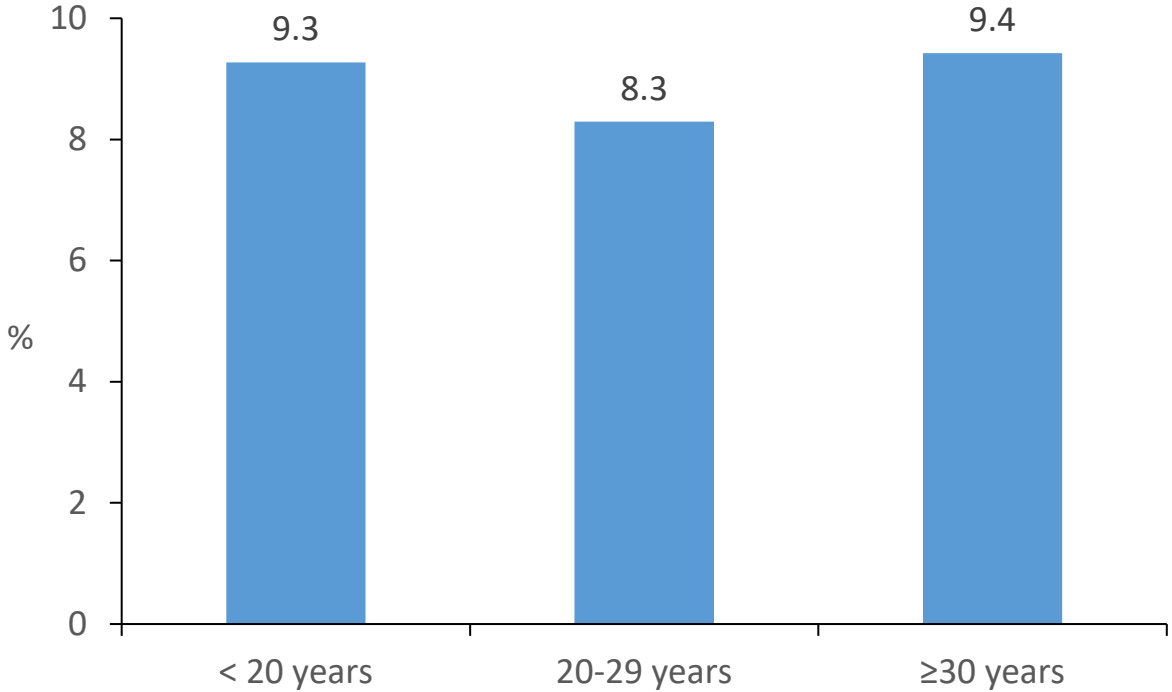
American Indian = 8.2

Asian/Pacific Islander = 10.2

Preterm birth rate is defined as number of births delivered before 37 completed weeks of gestation per 100 live births. Gestational age is based on the obstetric estimate of gestation.



# Preterm Birth (Estimated Gestational Age <37 Weeks) by Maternal Age, Prosperity Region 1, 2015-2019

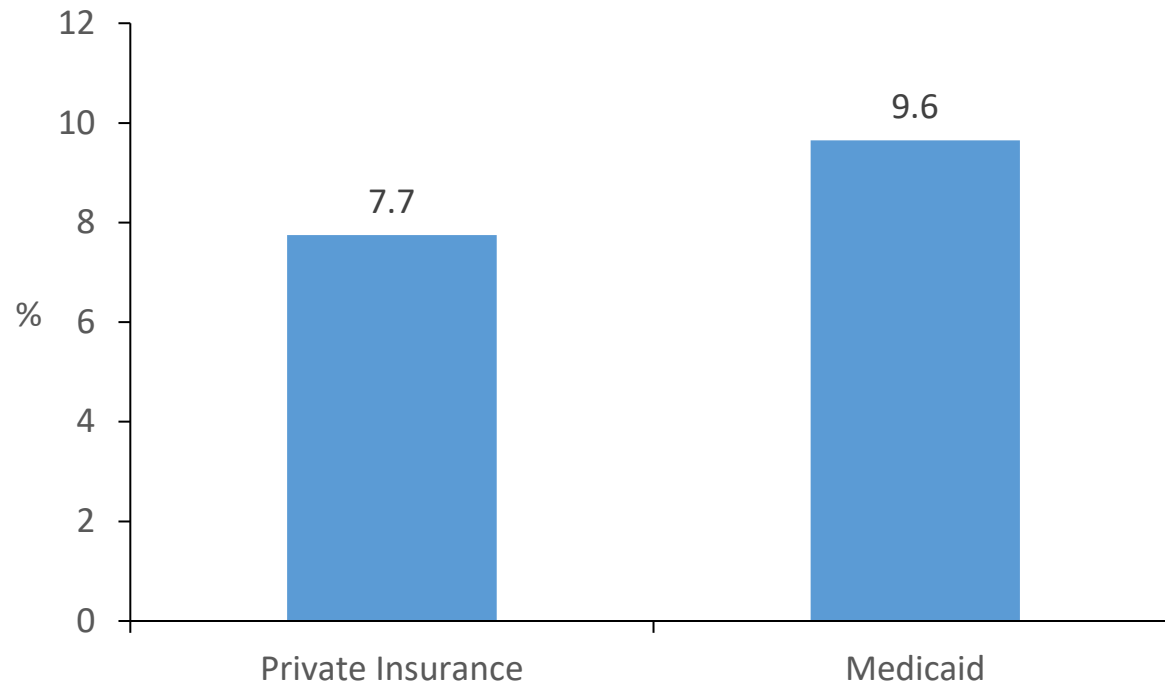


| Maternal Age | # Live Births | # PTB | PTB % |
|--------------|---------------|-------|-------|
| < 20 years   | 690           | 64    | 9.3   |
| 20-29 years  | 7,353         | 610   | 8.3   |
| ≥30 years    | 5,295         | 499   | 9.4   |

2015-2019 Michigan Percentages  
 < 20 years = 10.6  
 20-29 years = 9.6  
 ≥30 years = 10.6

Preterm birth rate is defined as number of births delivered before 37 completed weeks of gestation per 100 live births. Gestational age is based on the obstetric estimate of gestation.

# Preterm Birth (Estimated Gestational Age <37 Weeks) by Intended Payment Source, Prosperity Region 1, 2015-2019

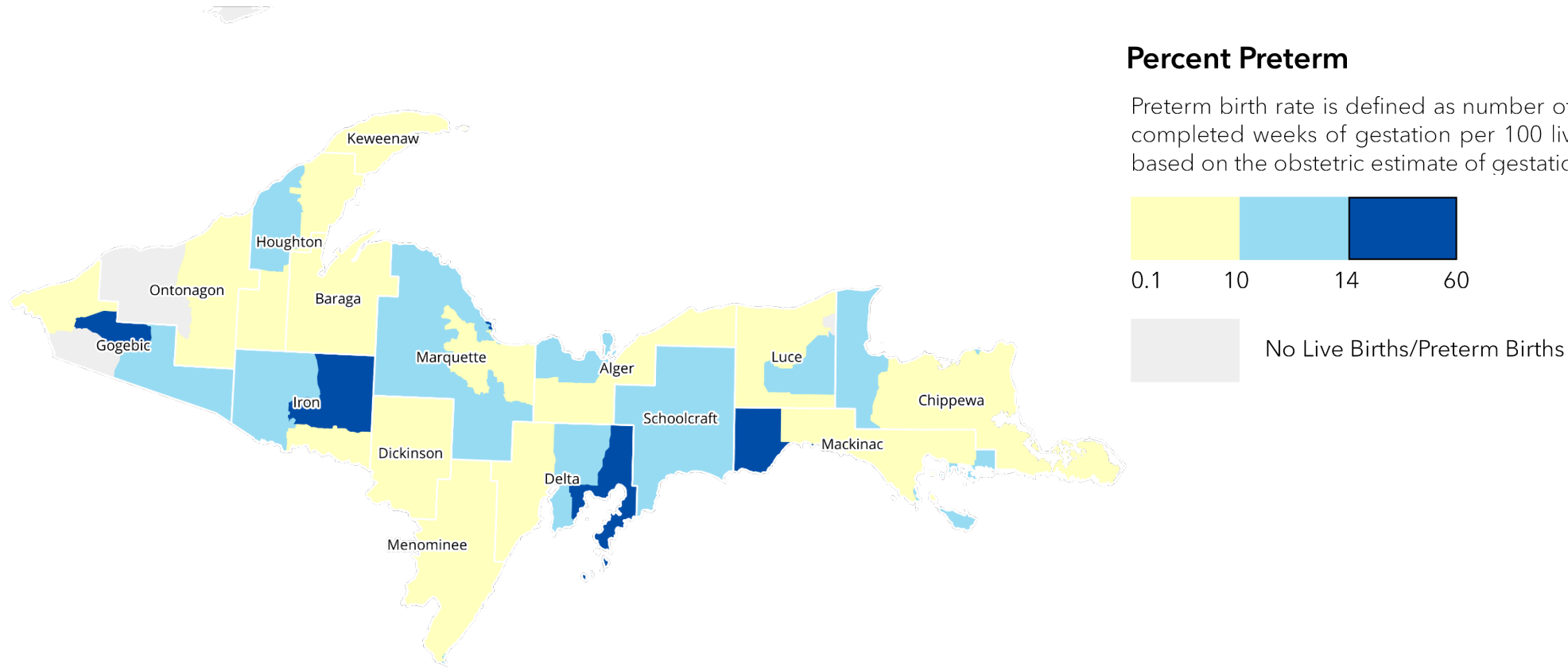


| Payment Source    | # Live Births | # PTB | PTB % |
|-------------------|---------------|-------|-------|
| Private Insurance | 6,364         | 493   | 7.7   |
| Medicaid          | 6,354         | 613   | 9.6   |

2015-2019 Michigan Percentages  
 Private Insurance = 9.2  
 Medicaid = 11.3

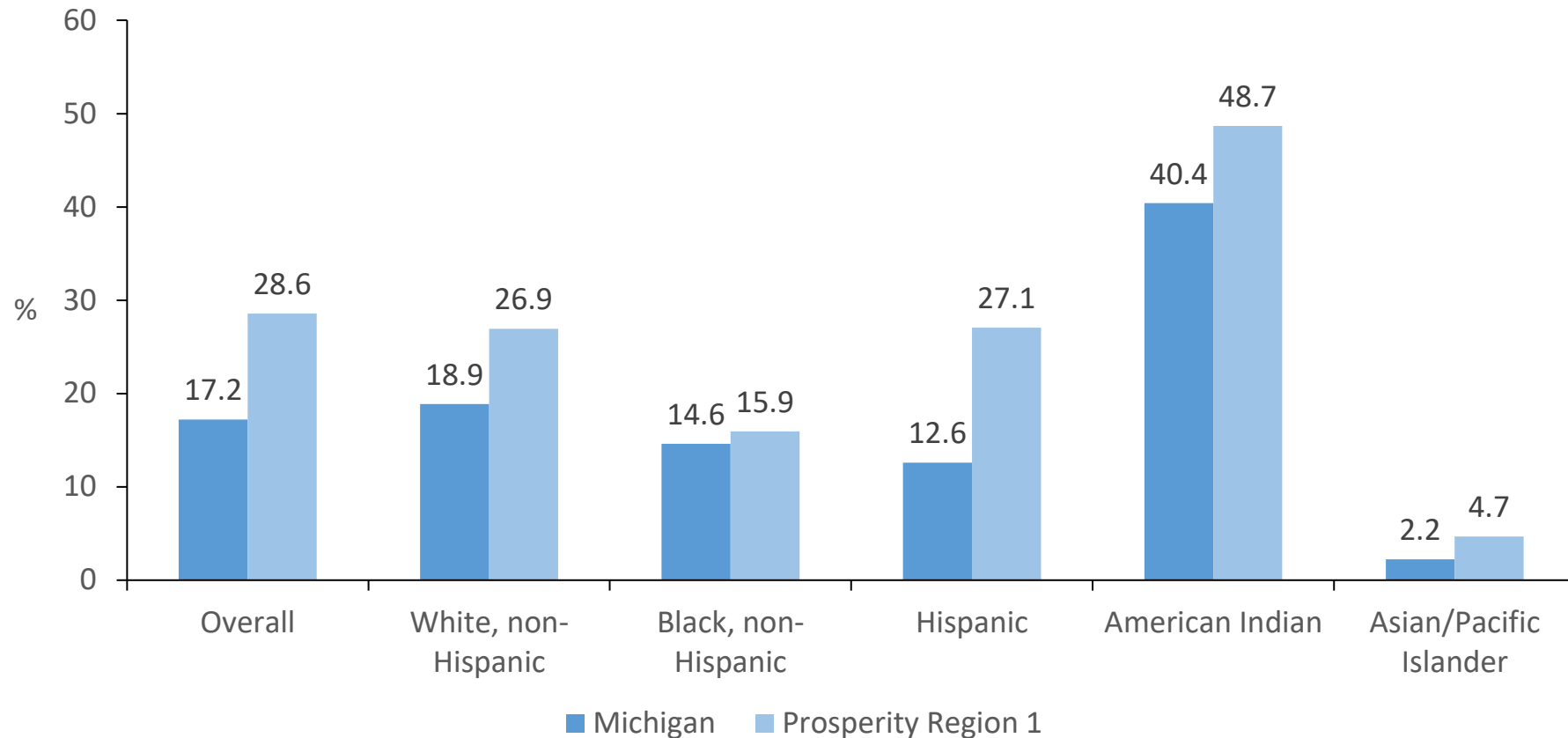
Preterm birth rate is defined as number of births delivered before 37 completed weeks of gestation per 100 live births. Gestational age is based on the obstetric estimate of gestation.

# Preterm Births by Census Tract Prosperity Region 1, 2014-2018



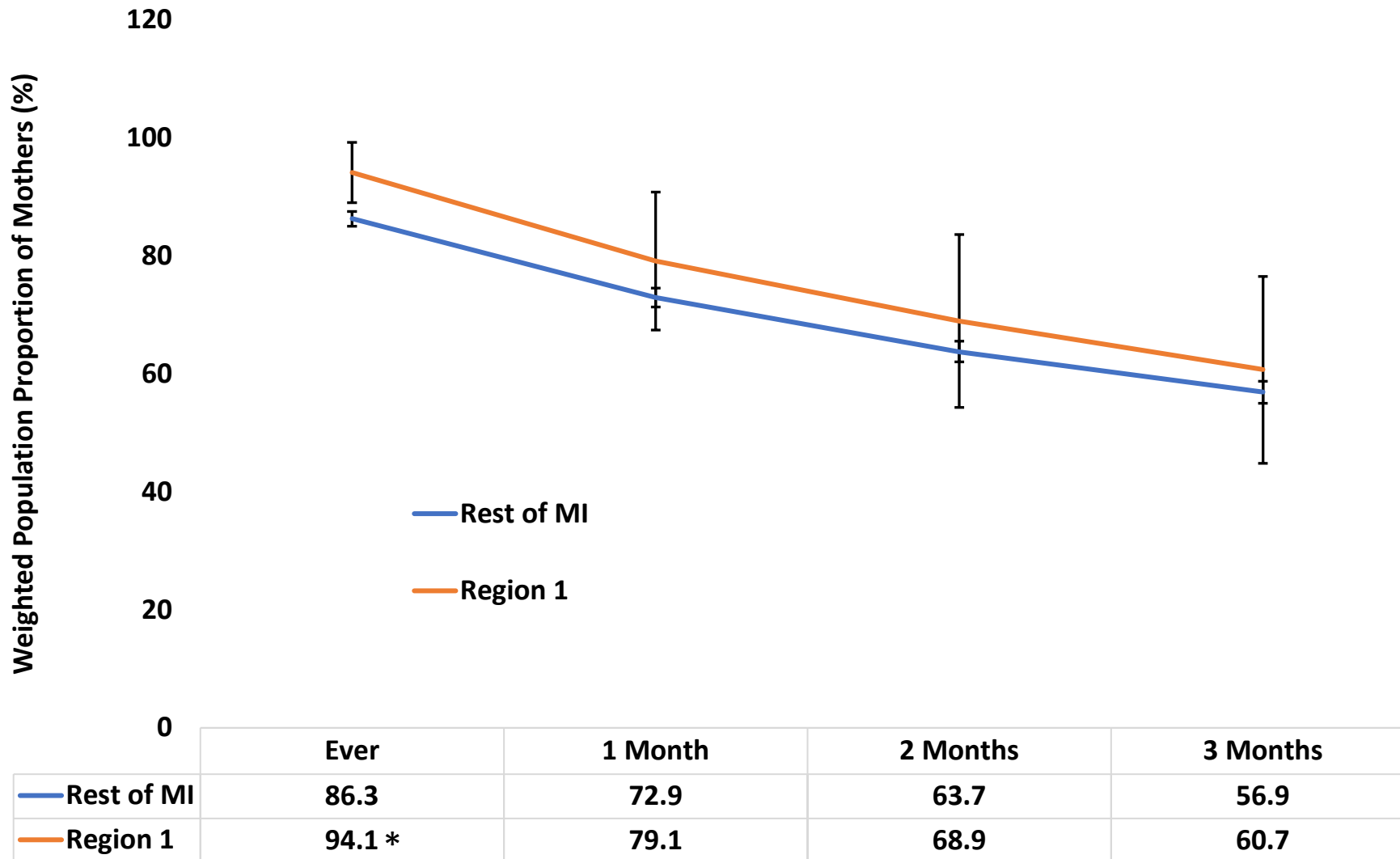
# Smoking During Pregnancy, Prosperity Region 1, 2015-2019

# Smoking During Pregnancy by Maternal Race/Ethnicity, Michigan and Prosperity Region 1, 2015-2019



# Breastfeeding Initiation and Duration, Prosperity Region 1

## Breastfeeding Initiation and Duration, Region 1 v Rest of Michigan MI PRAMS 2016-2018



- Breastfeeding in Region 1 differs significantly from the remainder of the State for:

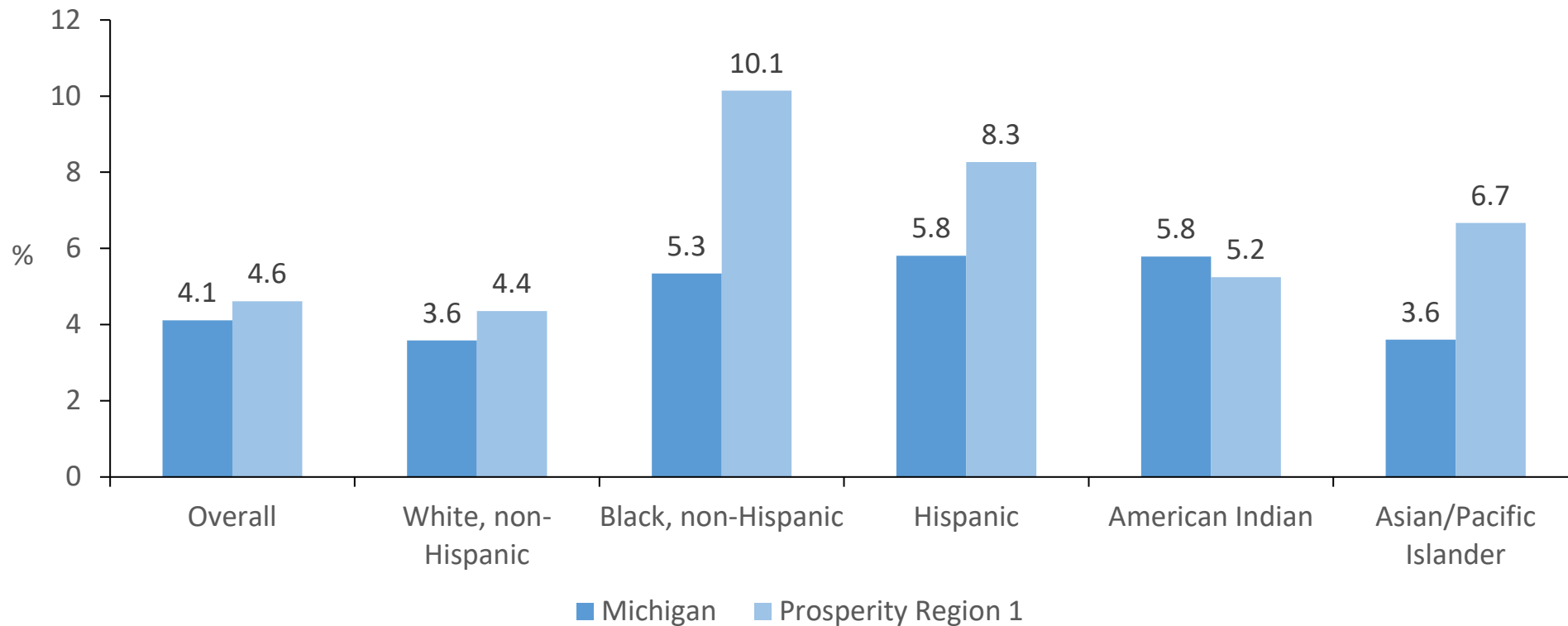
- Initiation
  - $p = 0.04$

\* Relative Standard Error exceeds 30%; Interpret with Caution

# Late Entry into Prenatal Care, Prosperity Region 1, 2015-2019



# Late Entry Into Prenatal Care by Maternal Race/Ethnicity, Michigan and Prosperity Region 1, 2015-2019

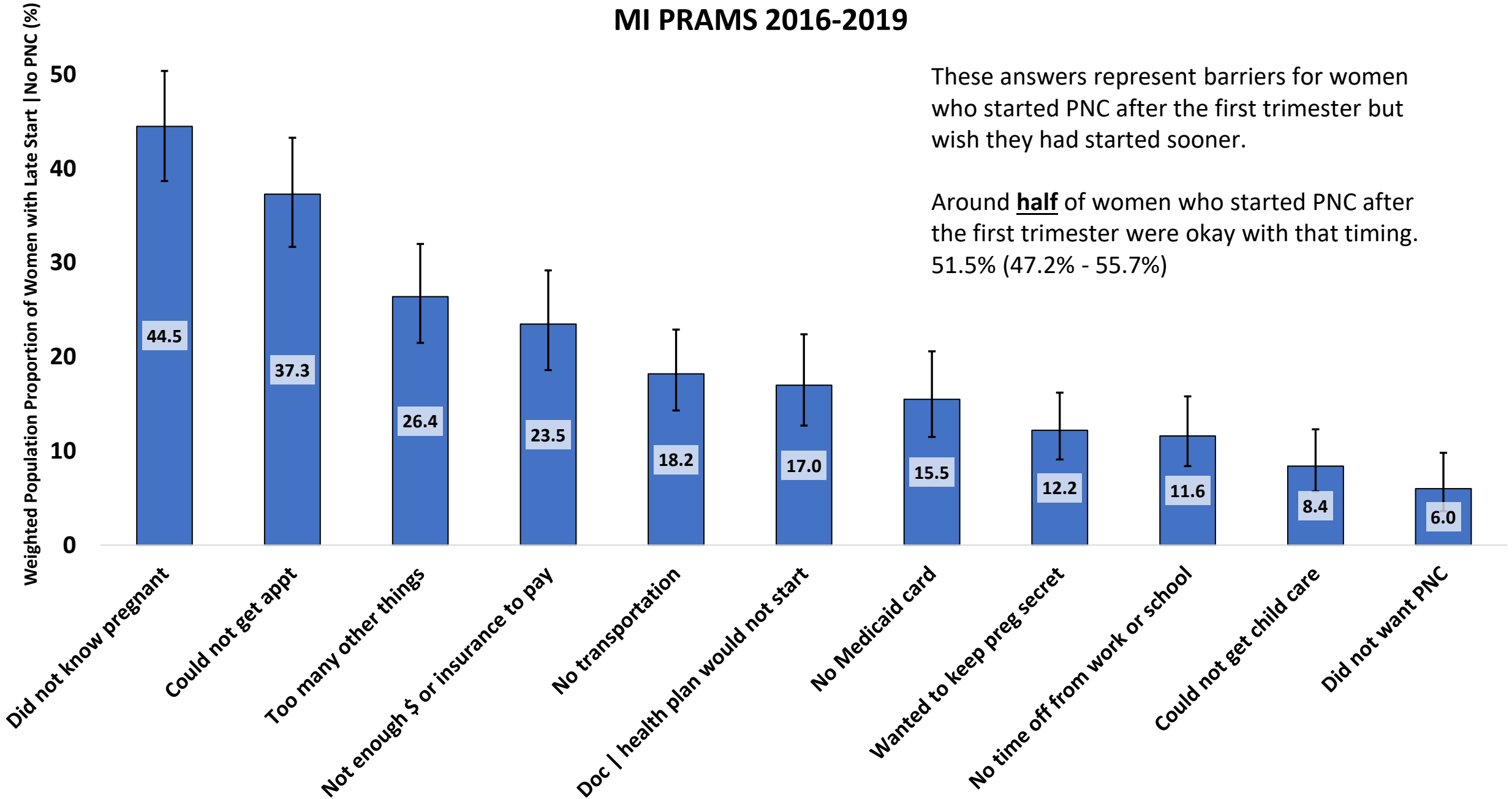


- Late entry into prenatal care refers to begin prenatal care in the 7<sup>th</sup> – 9<sup>th</sup> month of gestation

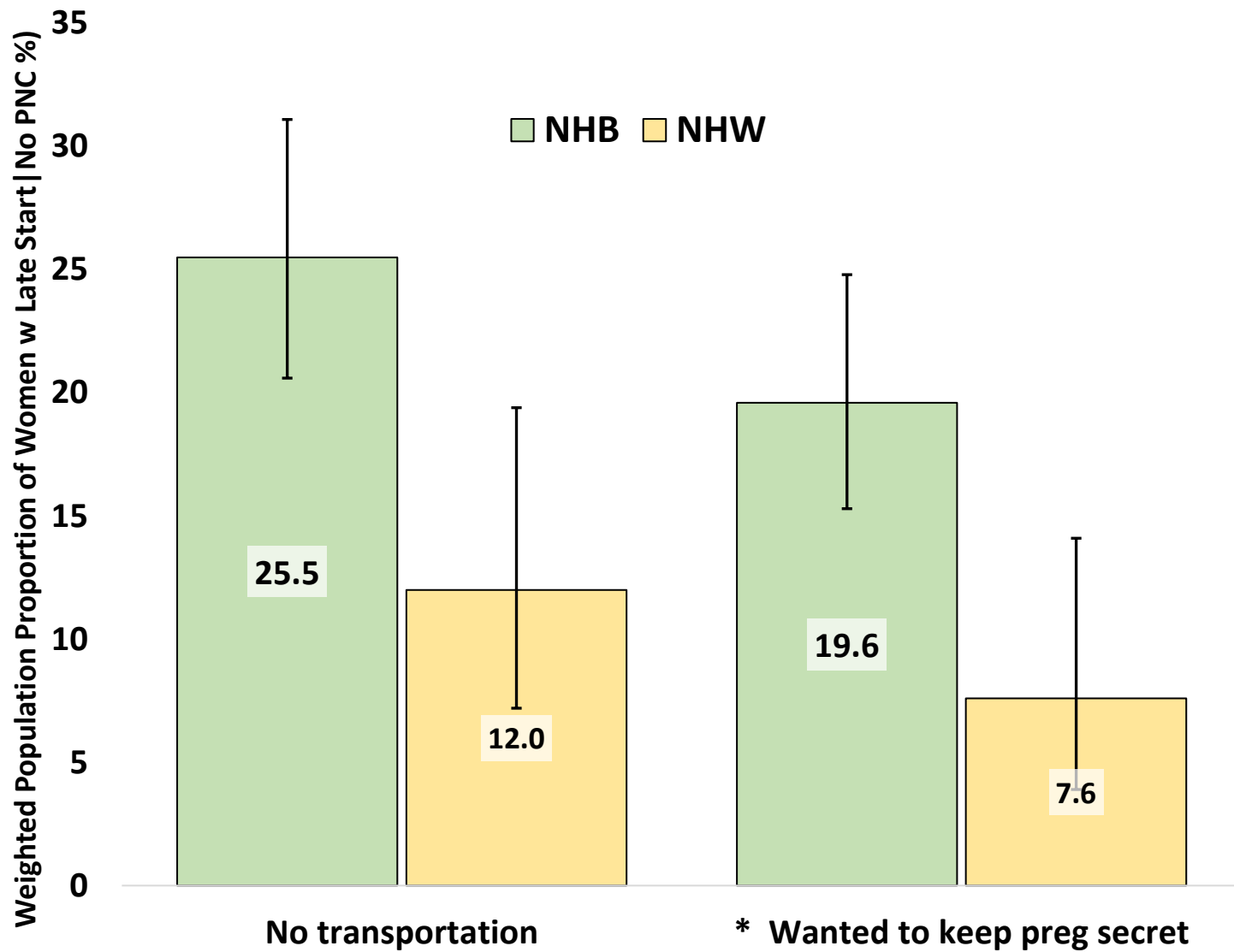
# Barriers to Prenatal Care, Michigan, 2016-2019

# PNC Barriers - mother started PNC AFTER 1st trimester and wanted to start sooner

## MI PRAMS 2016-2019

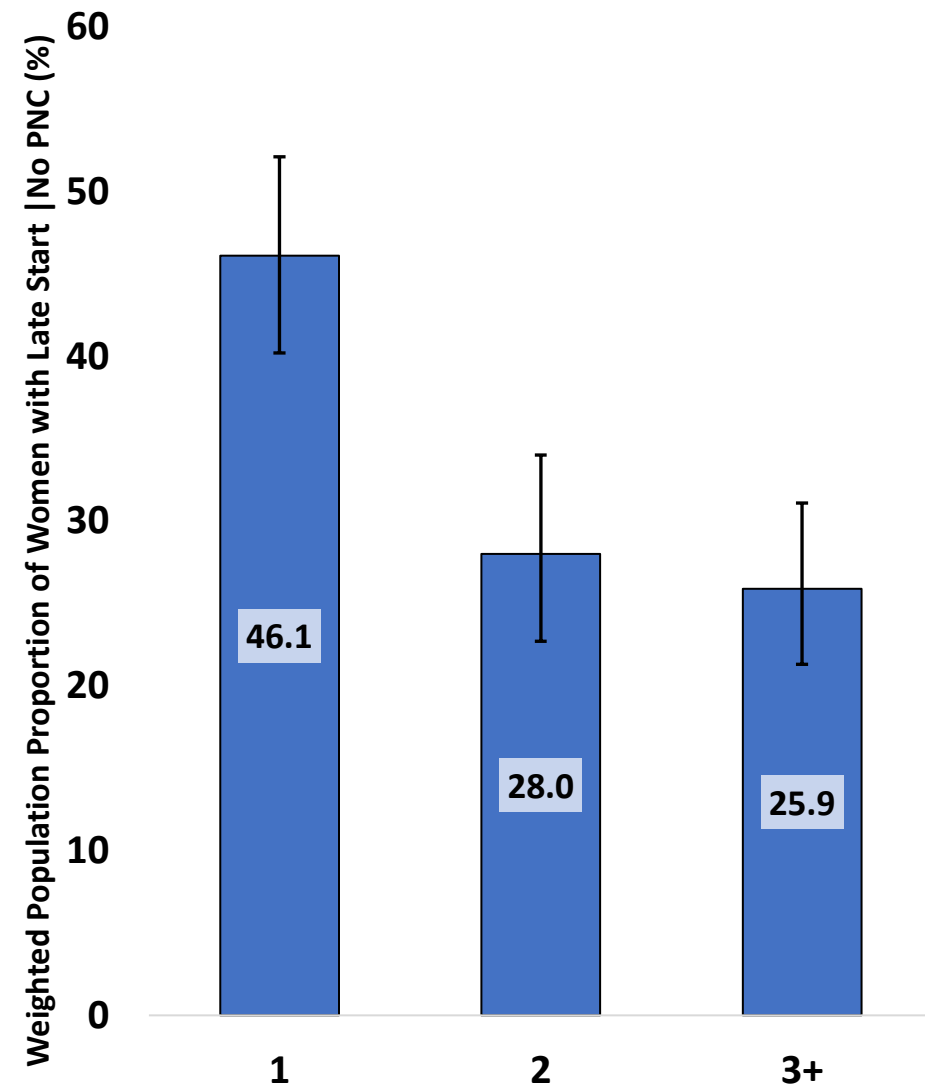


**Selected PNC Barriers with Significant Differences by Maternal Race/Ethnicity  
MI PRAMS 2016-2019**



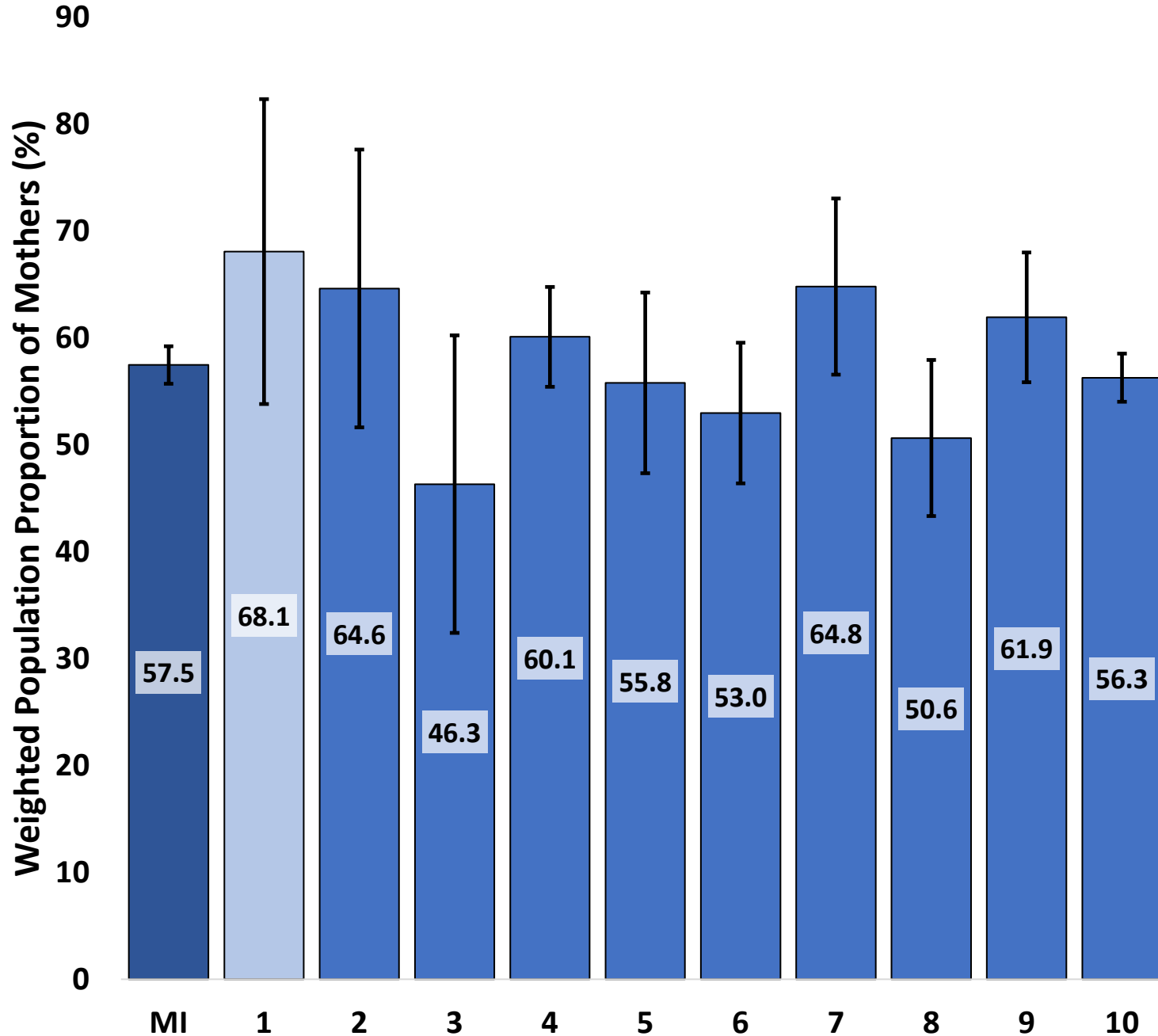
\* Relative Standard Error between 30-50%; interpret estimate with caution

**Number of PNC Barriers - women with late | no PNC  
MI PRAMS 2016-2019**



# Pregnancy Intention, Prosperity Region 1, 2016-2018

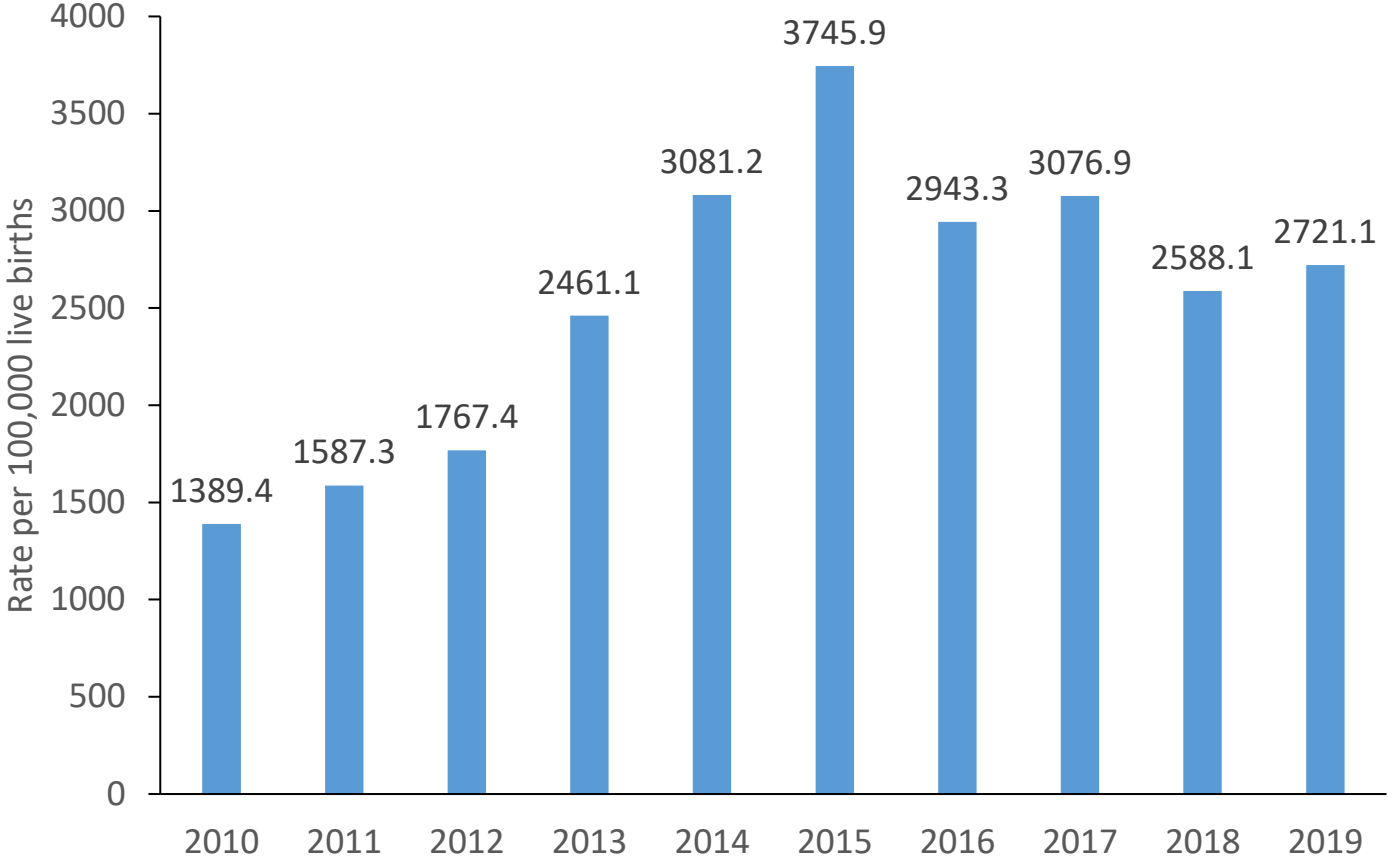
## Intended Pregnancy; MI PRAMS 2016-2018



- Intended Pregnancy
- Derived from question about pregnancy timing
- Intended
  - Women who said they had wanted pregnancy for some time, or wanted to be pregnant right when they conceived
- Unintended
  - Women who wanted to be pregnant some time in the future, never again, or were unsure
- Although there is variation across the state, none of the differences are large enough to achieve statistical significance

# Neonatal Abstinence Syndrome (NAS) Prosperity Region 1, 2010-2019

# Neonatal Abstinence Syndrome\*, Prosperity Region 1, 2010-2019 (Rate per 100,000 Live Births)



| Year | # Live Births | # NAS | NAS Rate |
|------|---------------|-------|----------|
| 2010 | 2,807         | 40    | 1,425.0  |
| 2011 | 2,835         | 45    | 1,587.3  |
| 2012 | 2,829         | 50    | 1,767.4  |
| 2013 | 2,763         | 68    | 2,461.1  |
| 2014 | 2,856         | 88    | 3,081.2  |
| 2015 | 2,723         | 102   | 3,745.9  |
| 2016 | 2,786         | 82    | 2,943.3  |
| 2017 | 2,665         | 82    | 3,076.9  |
| 2018 | 2,666         | 69    | 2,588.1  |
| 2019 | 2,499         | 68    | 2,721.1  |

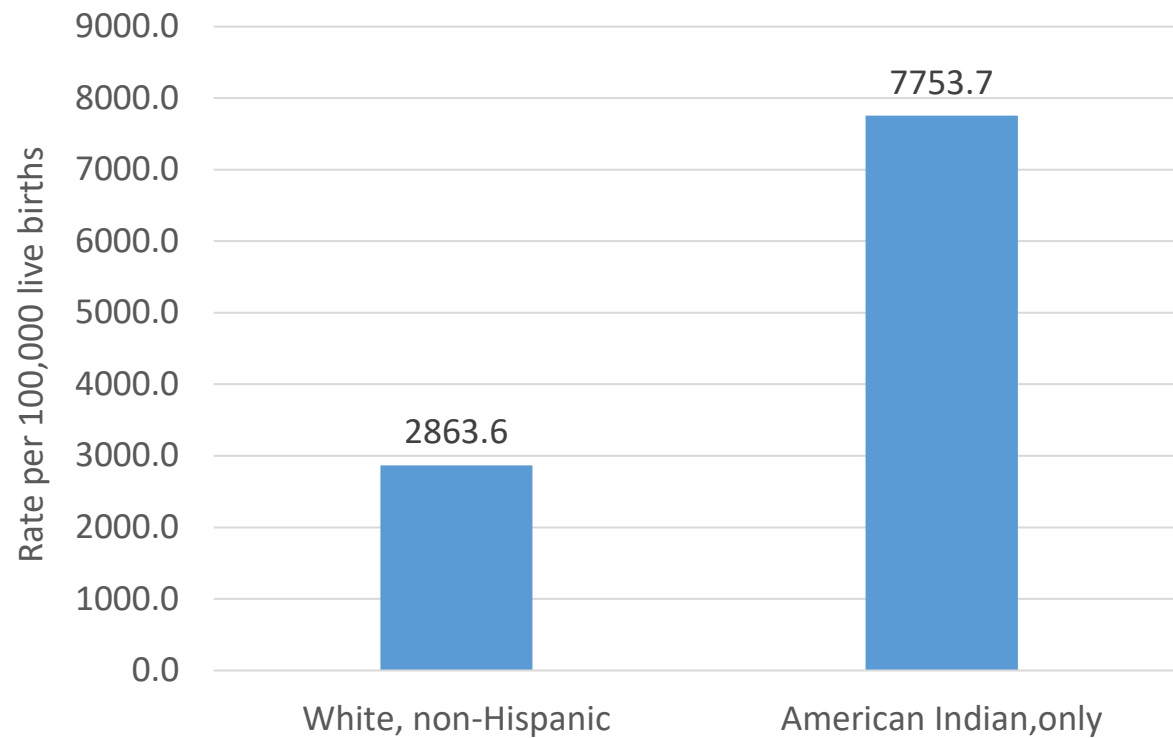
**2019 Michigan Rate = 623.7**

\* 2010-2015: 779.5 (drug withdrawal syndrome in newborn) and 2016-current: P96.1 (neonatal withdrawal symptoms from maternal use of drugs of addiction)

Data source: MDHHS Division for Vital Records and Health Statistics. Michigan resident live birth file linked to the Michigan Inpatient Hospital Database.



# Neonatal Abstinence Syndrome\* by Maternal Race/Ethnicity, Prosperity Region 1, 2015-2019



| Maternal Race/Ethnicity | # Live Births | # NAS | NAS Rate |
|-------------------------|---------------|-------|----------|
| White non-Hispanic      | 11,419        | 327   | 2,863.6  |
| Black non-Hispanic      | 69            | DNS   | DNS      |
| Hispanic                | 266           | DNS   | DNS      |
| American Indian         | 877           | 68    | 7,753.7  |

DNS: data not sufficient (0<N<6).

2015-2019 Michigan Rates  
 White, nH = 943.1  
 American Indian = 4,610.1

\* 2015: 779.5 (drug withdrawal syndrome in newborn) and 2016-current: P96.1 (neonatal withdrawal symptoms from maternal use of drugs of addiction)

# Birth Defects Prevalence, by Race/Ethnicity and Prosperity Region, 2017

# Birth Defect Prevalence Rates by Race/ethnicity: MBDR, 2017

- Throughout birth years 2010-2017, the birth defect prevalence rate for Michigan remained fairly steady at an average rate of 1,374.2 cases per 10,000 live births.
- In 2017, the race-specific birth defect prevalence rate for cases born to black mothers (1,725.4 cases per 10,000 live births) exceeded that of cases born to white mothers (1,079.3 cases per 10,000 live births) and cases born to mothers of “other” races (1,654.5 cases per 10,000 live births).
- In 2017, the ethnicity-specific birth defect prevalence rate for cases born to a mother reporting Arabic ethnicity (1,742.2 cases per 10,000 live births) was greater than that of cases born to a mother reporting Hispanic ethnicity (1,087.8 cases per 10,000 live births).

\* Total reported birth defect cases for all diagnostic groupings per 10,000 live births

\*\*Maternal Race/ethnicity as reported on birth record

Figure 1. Statewide Maternal Race-Specific Birth Defect Prevalence Rates: MBDR, 2017

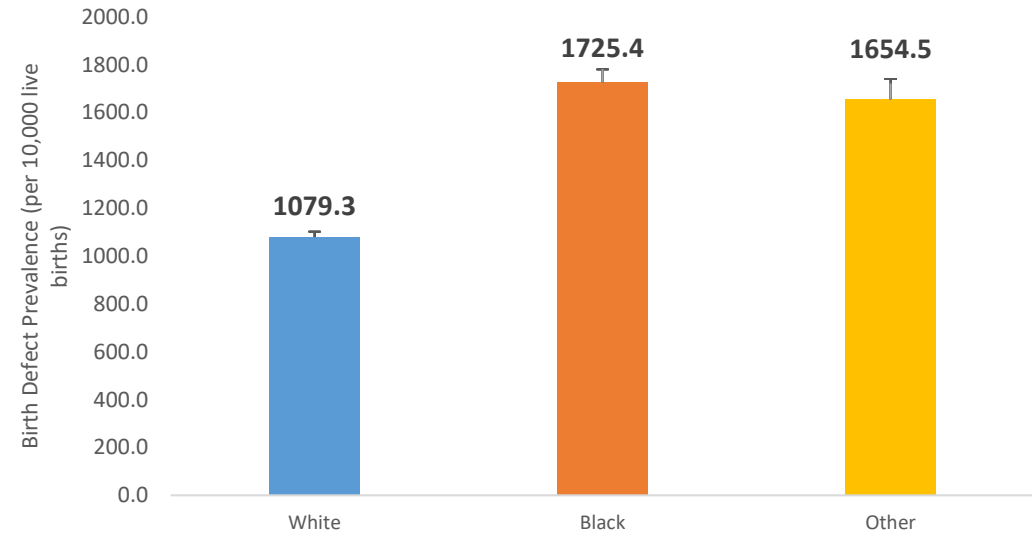
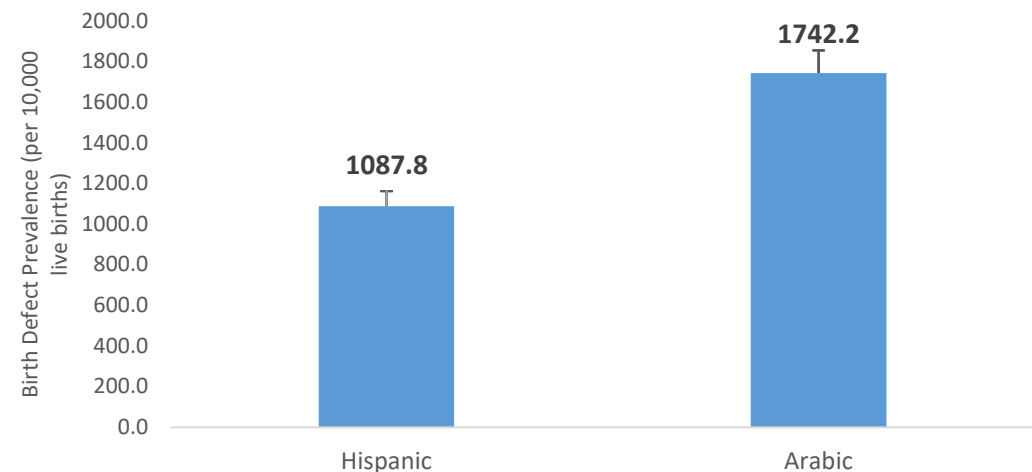
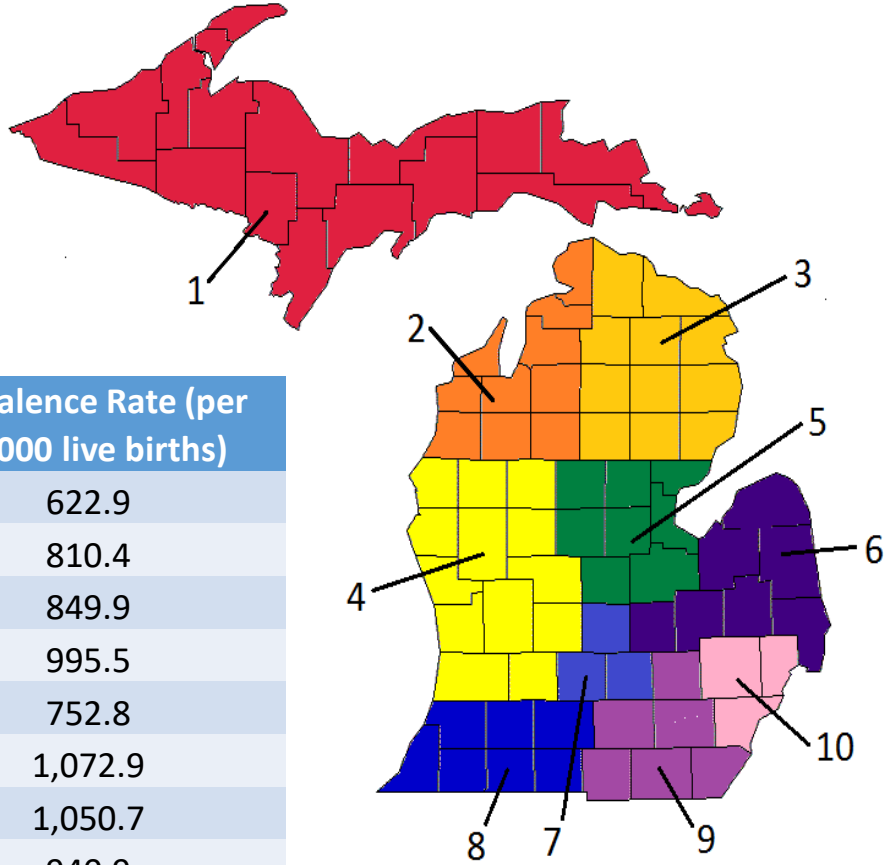


Figure 2. Statewide Maternal Ethnicity-Specific Birth Defect Prevalence Rates: MBDR, 2017



# Birth Defect Prevalence Rates by Prosperity Region: MBDR, 2017

- The State of Michigan is broken up into 10 prosperity regions based on shared geographic, demographic, and economic interests.
- In 2017, Michigan prosperity regions 9 and 10 reported the highest birth defect prevalence rates of 1,619.9 and 1,872.5 cases per 10,000 live births.
- The prosperity region that reported the lowest birth defect prevalence was region 1 with a prevalence rate of 622.9 cases per 10,000 live births.



| Region       | Number of Cases | Prevalence Rate (per 10,000 live births) |
|--------------|-----------------|--|
| 1            | 166             | 622.9                                    |
| 2            | 233             | 810.4                                    |
| 3            | 154             | 849.9                                    |
| 4            | 1,930           | 995.5                                    |
| 5            | 443             | 752.8                                    |
| 6            | 959             | 1,072.9                                  |
| 7            | 539             | 1,050.7                                  |
| 8            | 844             | 940.9                                    |
| 9            | 1,644           | 1,619.9                                  |
| 10           | 8,556           | 1,872.5                                  |
| <b>Total</b> | <b>15,468</b>   | <b>1,387.2</b>                           |

\*All statewide data reported from the Michigan Birth Defects Registry (MBDR) for birth year 2017  
 \*\* Total reported birth defect cases for all diagnostic groupings per 10,000 live births  
 \*\*\*Prevalence rates are based on births to mothers living in Michigan at the time of delivery.  
 \*\*\*\*Regions approximate prosperity region boundaries

Statewide Birth Defect Prevalence Rates by Prosperity Region with Prosperity Region Map: MBDR, 2017

# Sleep-Related Infant Death Rate Prosperity Region 1, 2010-2018

# Overview of Sleep-Related Infant Deaths in Michigan 2010-2018

- Between 2010 and 2018 there were **1,287** sleep-related infant deaths in Michigan.
- The rate of sleep-related infant deaths has fluctuated slightly but has not statistically significantly differed between years (Figure 1).
- Between 2010 and 2018 Black Infants were 3.5 times more likely to die of sleep-related causes as compared to white Infants. Infants of races Other than white and Black were 2.4 times more likely to die of sleep-related causes as compared to white infants (Figure 2).

Figure 1. Rate of Sleep-Related Infant Deaths per 1,000 Live Births

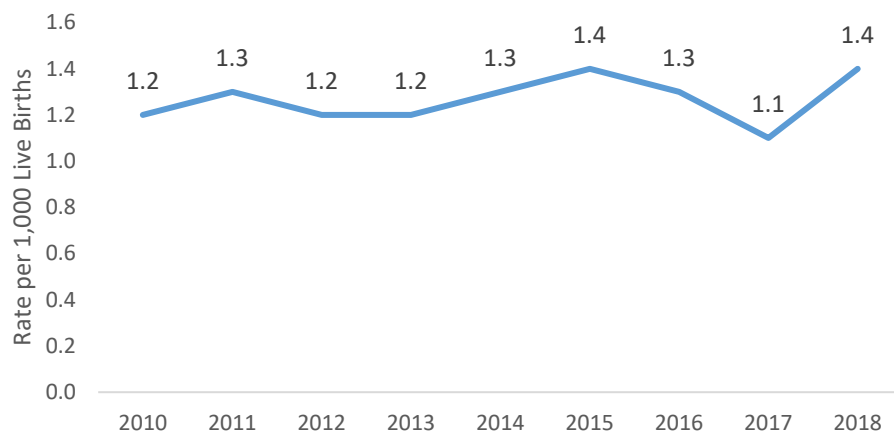
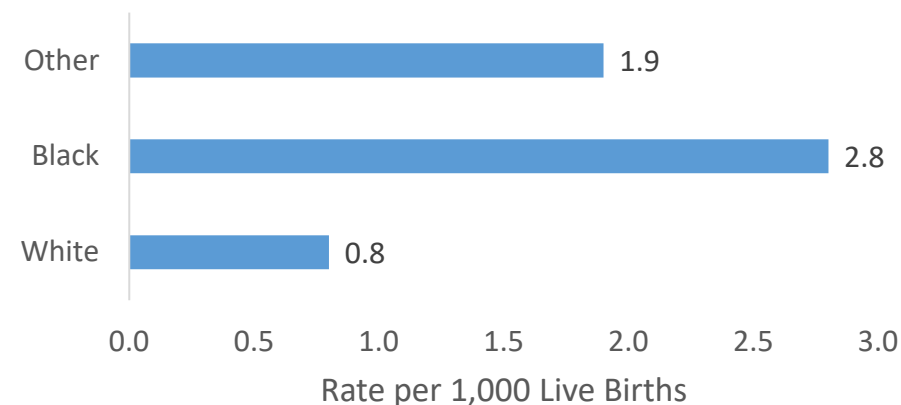
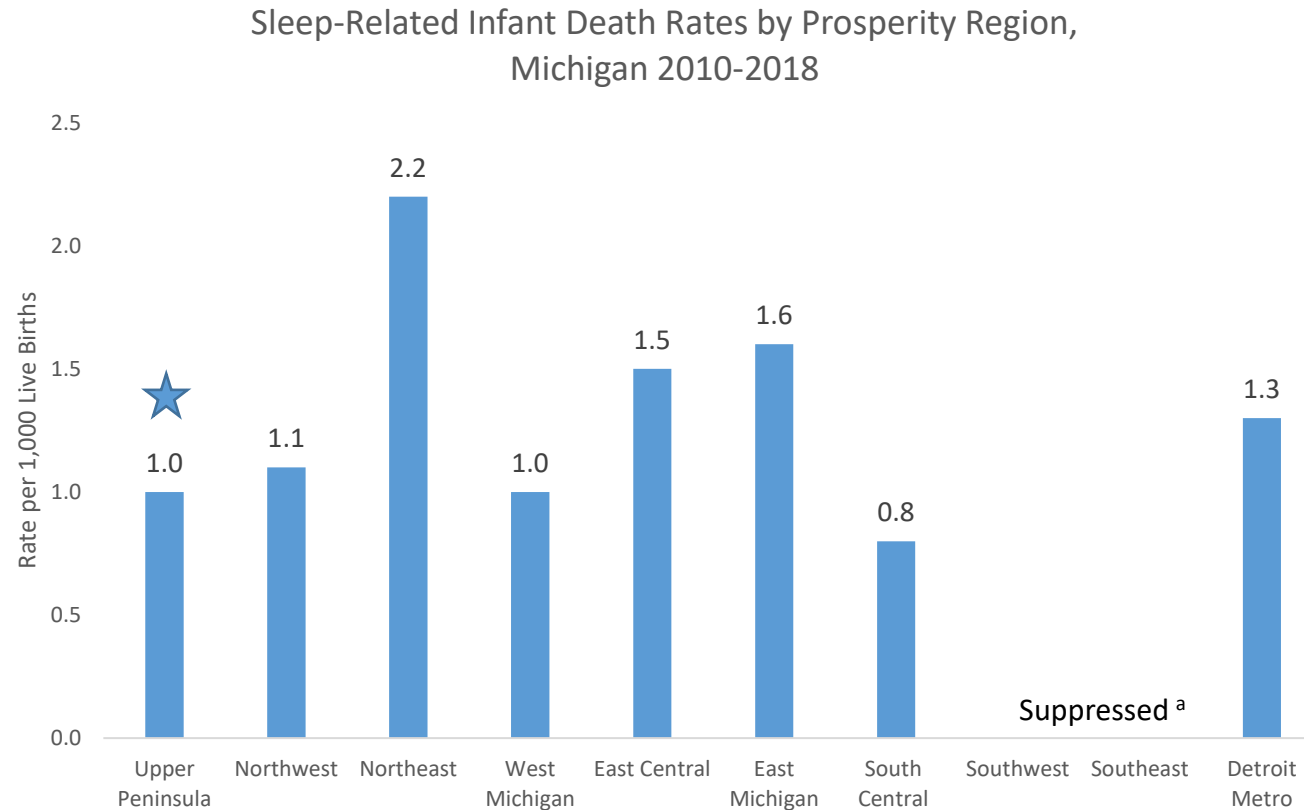


Figure 2. Rate of Sleep-Related Infant Deaths per 1,000 Live Births, by Race



# Sleep-Related Infant Death Rate, Prosperity Region 1, 2010-2018

(rate per 1,000 live births)



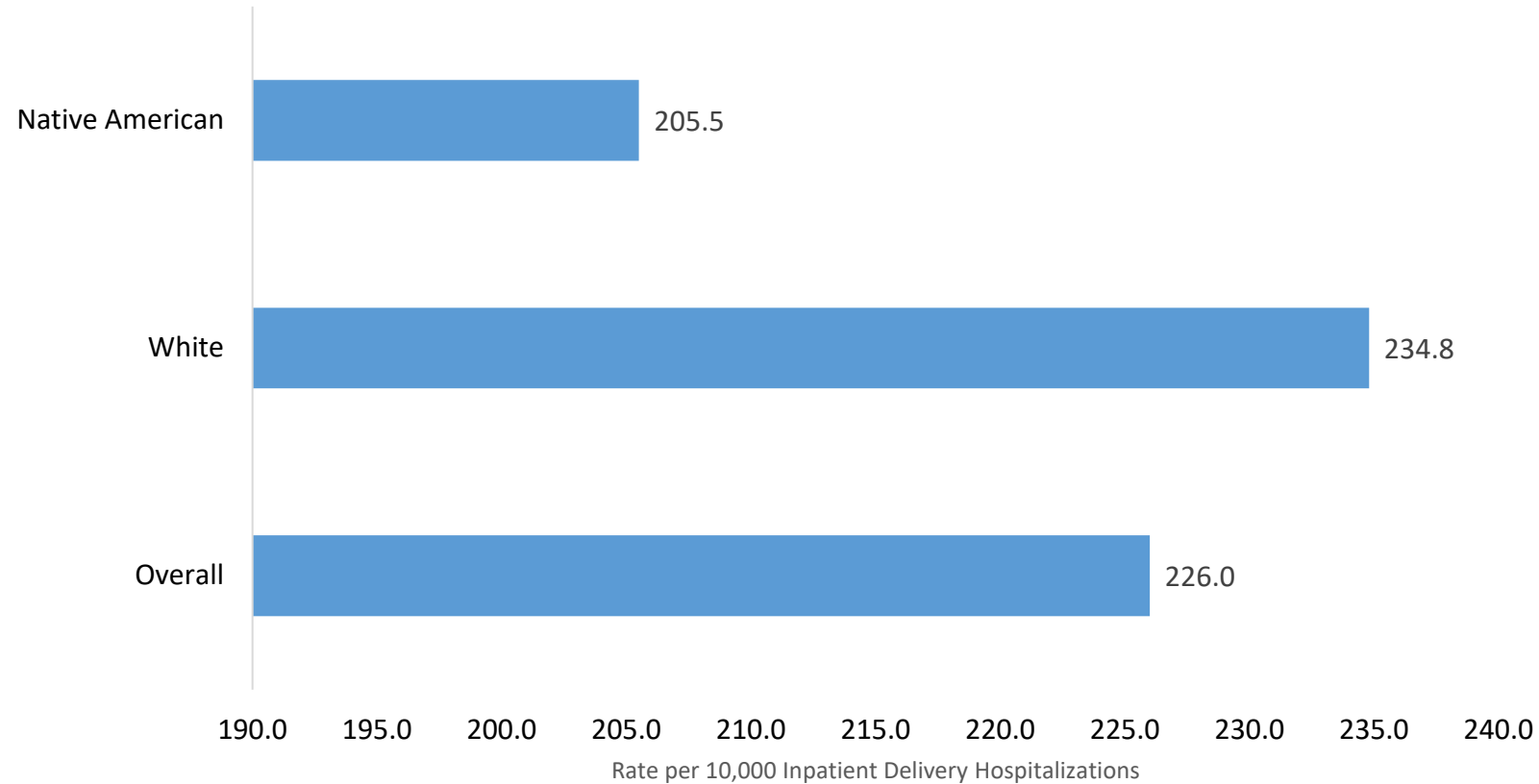
- Between 2010 and 2018 there were **26** sleep-related infant deaths in Region One.
- The Region One sleep-related infant death rate of 1.0 per 1,000 live births was **lower** than the Michigan sleep-related death rate (Michigan rate: 1.3 per 1,000 live births), although the difference was not statistically significant.

<sup>a</sup> Data for Regions 8 and 9 suppressed as to not inadvertently identify a suppressed county level statistics. County level data can be found at [https://www.keepingkidsalive.org/wp-content/uploads/Sleep-Related-Infant-Deaths-in-Michigan\\_2010-to-2018.pdf](https://www.keepingkidsalive.org/wp-content/uploads/Sleep-Related-Infant-Deaths-in-Michigan_2010-to-2018.pdf)

# Severe Maternal Morbidity Rate Prosperity Region 1, 2019



# Severe Maternal Morbidity, Prosperity Region 1, 2019 (rate per 10,000 delivery hospitalizations)



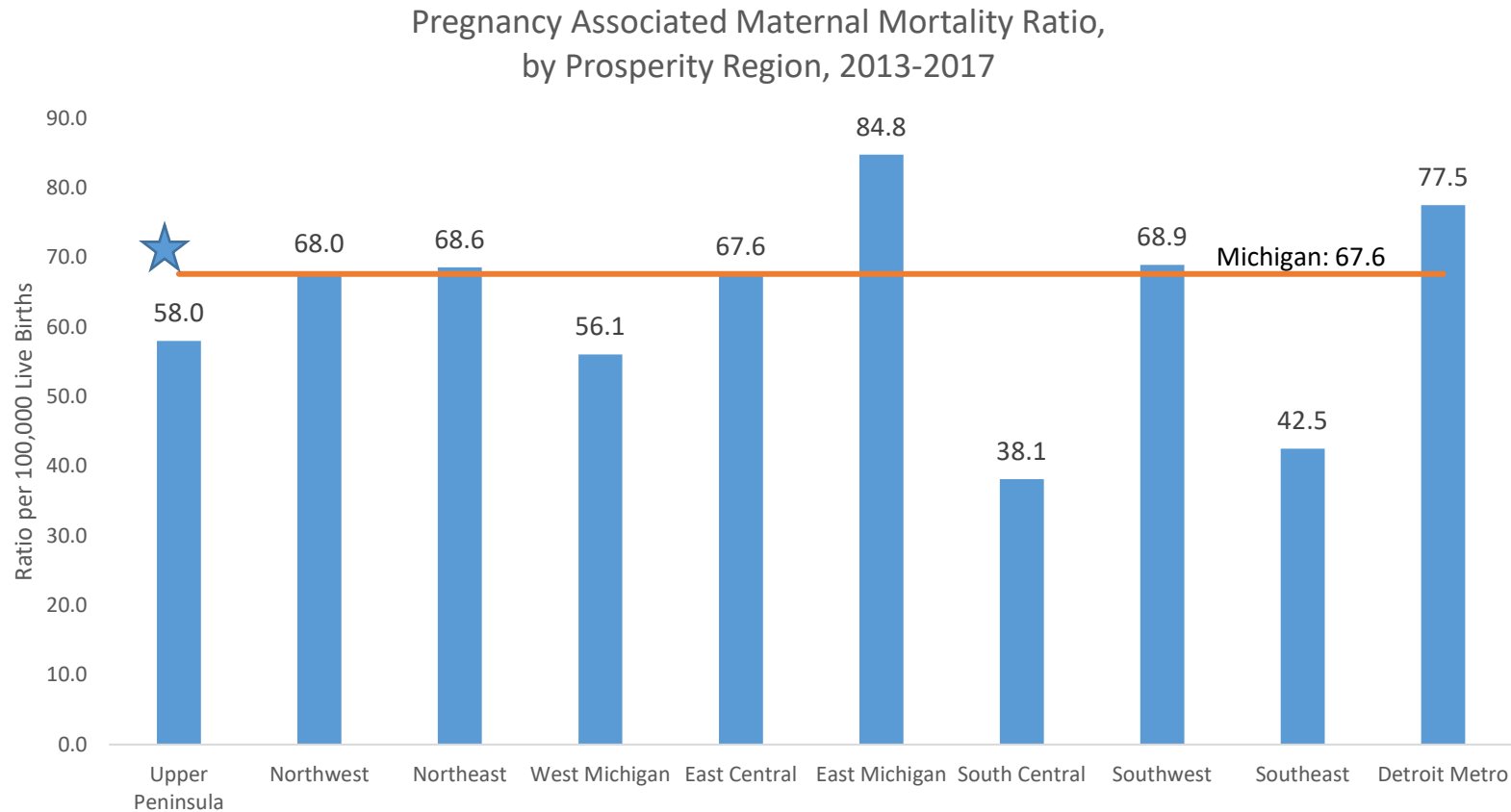
| 2019 Michigan Rates |       |
|---------------------|-------|
| Overall:            | 194.3 |
| White:              | 157.6 |
| Black:              | 321.1 |
| Asian:              | 192.1 |
| Native American:    | 155.7 |
| Hispanic:           | 205.7 |

\* Statistics for other races are suppressed due to insufficient sample sizes.

# Maternal Mortality Ratio Prosperity Region 1, 2013-2017

# Maternal Mortality Ratio, Prosperity Region 1, 2013-2017

(ratio per 100,000 live births)



- Maternal deaths include deaths that occur during pregnancy, at delivery or within one year of pregnancy.
- Total maternal mortality includes both pregnancy associated mortality (unrelated to the pregnancy), pregnancy-related mortality (related to or aggravated by the pregnancy), and deaths where pregnancy-relatedness is unable to be determined.
- In Region One there were **8** maternal deaths between 2013 and 2017