



# Maternal and Infant Health Statistics

## Prosperity Region 8

### Michigan

Prepared by Maternal and Child Health (MCH) Epidemiology Section,  
Michigan Department of Health and Human Services (MDHHS)

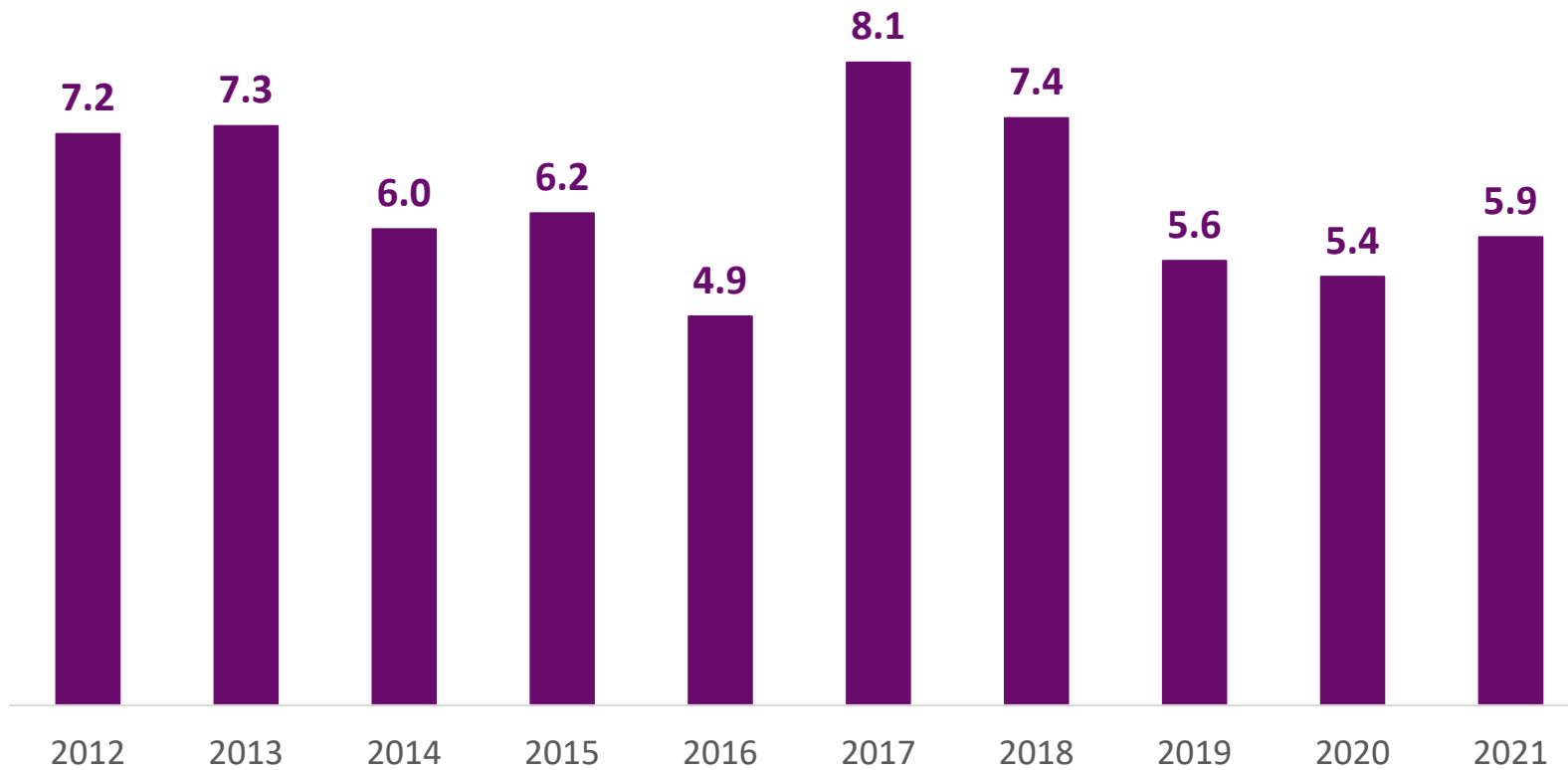
Data source: Michigan resident live birth files (10/06/22) and infant mortality files (11/03/22),  
Division for Vital Records and Health Statistics, MDHHS

July 2023

**Infant Mortality Rate (IMR)  
Prosperity Region 8  
2012-2021**

# Infant Mortality Rate Prosperity Region 8, 2012-2021

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.



**2021 Michigan Rate = 6.2**

Year	# Infant Deaths	# Births	Rate per 1,000 Live Births
2012	66	9,147	7.2
2013	70	9,582	7.3
2014	57	9,470	6.0
2015	57	9,268	6.2
2016	45	9,131	4.9
2017	73	8,970	8.1
2018	66	8,915	7.4
2019	49	8,711	5.6
2020	45	8,298	5.4
2021	49	8,364	5.9

# Infant Mortality Rates by Maternal Race/Ethnicity Prosperity Region 8, 2017-2021

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.

Maternal Race	# Infant Deaths	# Live Births	Infant Mortality Rate (per 1,000 Live Births)	MI
White Non-Hispanic	178	31,243	5.7	4.8
Black Non-Hispanic	78	6,103	12.8	13.6
Hispanic	14	3,678	3.8	5.6
American Indian	0	107	0	5.5
Asian/Pacific Islander	0<N<6	921	Data Not Sufficient	4.5

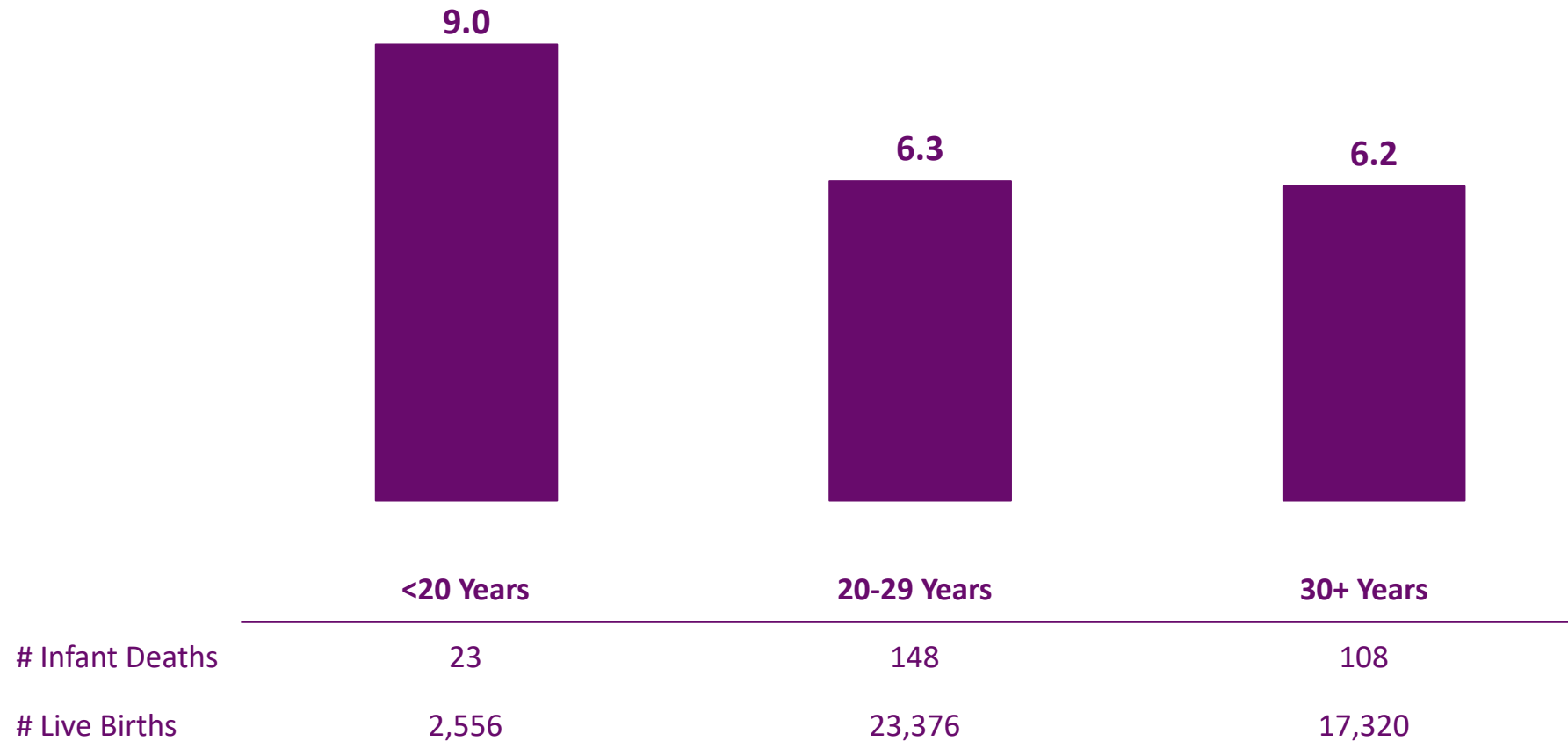
# Birth Outcomes by Race/Ethnicity Prosperity Region 8, 2017-2021

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.

Comparison of methods used to measure cases among Native Americans	# Live Births	# Infant Deaths	# Low Birthweight	# Preterm	IMR per 1,000 Live Births	% Low Birthweight	% Preterm
<b>#1:</b> Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	107	0	9	9	0.0	8.4%	8.4%
<b>#2:</b> Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	184	0	16	15	0.0	8.7%	8.2%
<b>#3:</b> Birthing mother is identified on the birth certificate as American Indian or Mixed race (i.e., American Indian or Alaskan Native) <b>OR</b> the father is listed as American Indian or Mixed Race (i.e., American Indian or Alaskan Native)	304	0	23	25	0.0	7.6%	8.2%

# Infant Mortality Rate by Maternal Age Prosperity Region 8, 2017-2021

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.



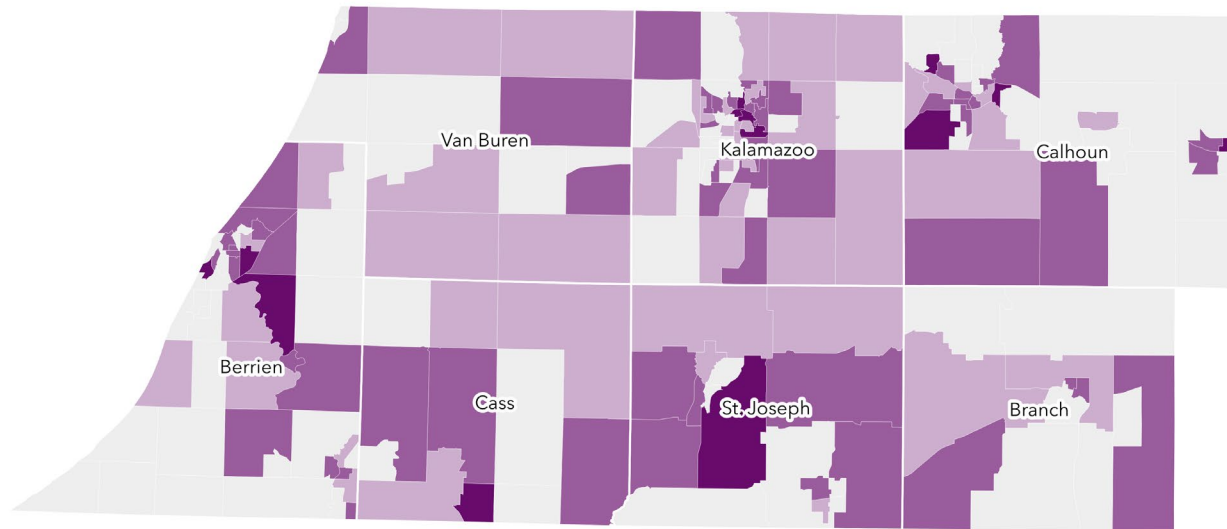
# Infant Mortality Rates by Intended Payment Source Prosperity Region 8, 2017-2021

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.

Payment	# Infant Deaths	# Live Births	Infant Mortality Rate (per 1,000 Live Births)	MI
Private Insurance	114	20,397	5.6	4.9
Medicaid	155	20,816	7.4	8.7

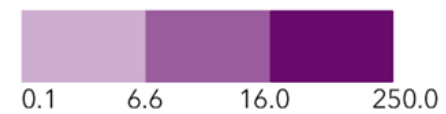
# Infant Mortality Rates by Census Tract Prosperity Region 8, 2016-2020

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 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.



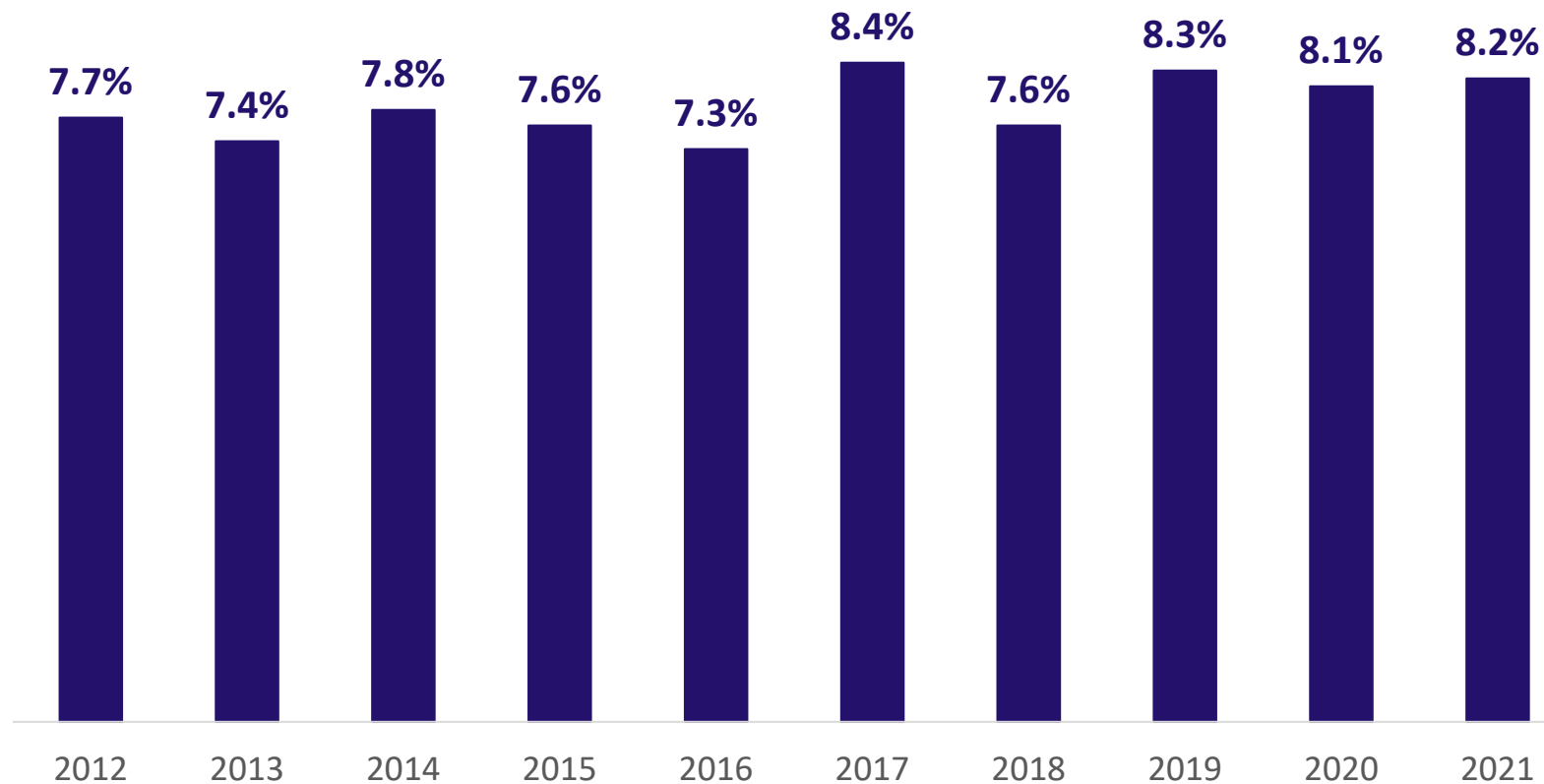
No Live Births/Infant Deaths



**Low Birthweight (LBW)  
Prosperity Region 8  
2012-2021**

# Low Birthweight Prosperity Region 8, 2012-2021

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



**2021 Michigan = 9.2%**

Year	# LBW	# Births	% LBW
2012	703	9,147	7.7
2013	710	9,582	7.4
2014	739	9,470	7.8
2015	700	9,268	7.6
2016	670	9,131	7.3
2017	749	8,970	8.4
2018	681	8,915	7.6
2019	726	8,711	8.3
2020	674	8,298	8.1
2021	687	8,364	8.2

# Low Birthweight by Maternal Race/Ethnicity Prosperity Region 8, 2017-2021

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

Maternal Race	# LBW	# Live Births	Percent (%) Low Birthweight	MI
White non-Hispanic	2,197	31,243	7.0%	7.2%
Black non-Hispanic	880	6,103	14.4%	15.2%
Hispanic	250	3,678	6.8%	7.7%
American Indian	9	107	8.4%	8.4%
Asian/Pacific Islander	76	921	8.3%	9.0%

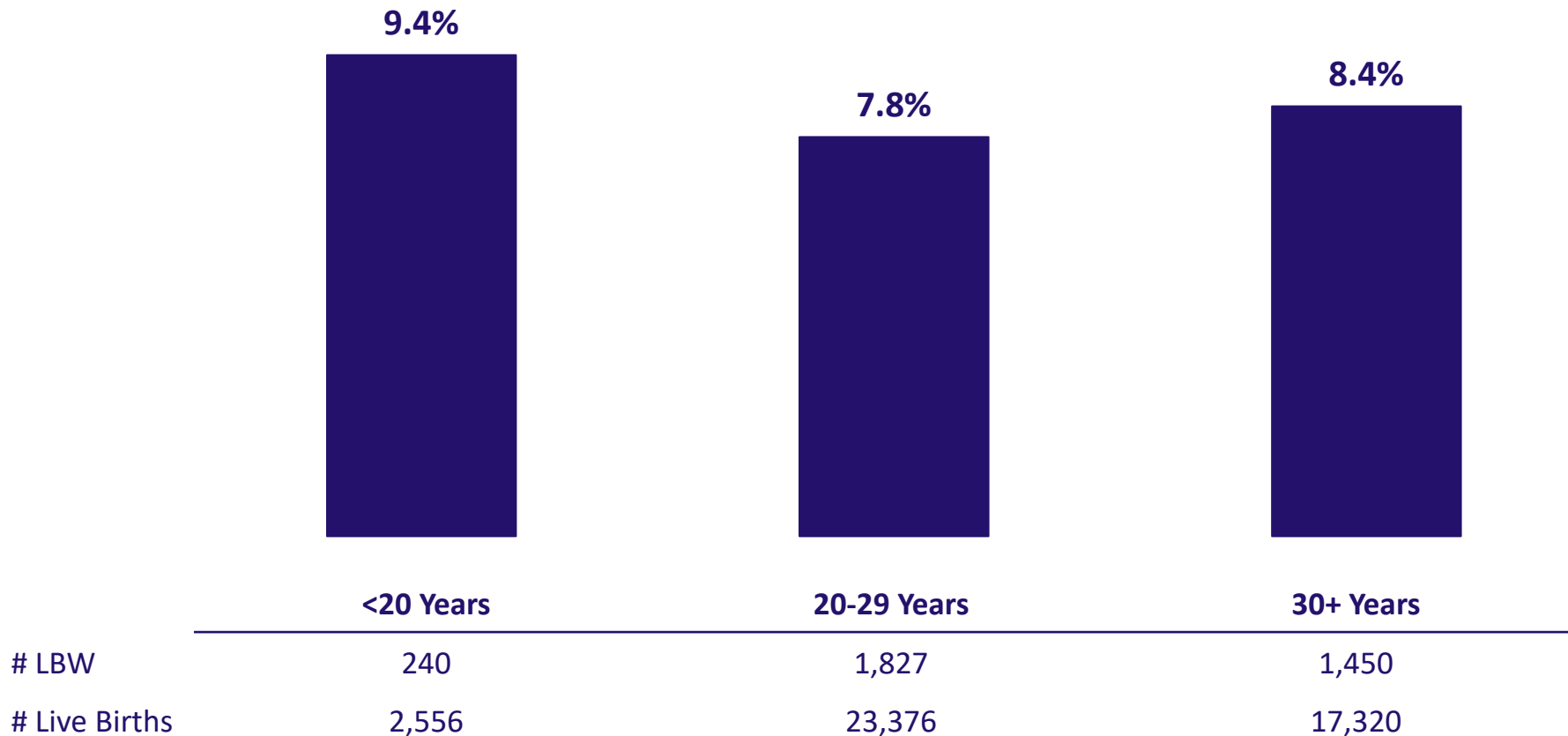
# Birth Outcomes by Race/Ethnicity Prosperity Region 8, 2017-2021

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

Comparison of methods used to measure cases among Native Americans	# Live Births	# Infant Deaths	# Low Birthweight	# Preterm	IMR per 1,000 Live Births	% Low Birthweight	% Preterm
#1: Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	107	0	9	9	0.0	8.4%	8.4%
#2: Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	184	0	16	15	0.0	8.7%	8.2%
#3: Birthing mother is identified on the birth certificate as American Indian or Mixed race (i.e., American Indian or Alaskan Native) OR the father is listed as American Indian or Mixed Race (i.e., American Indian or Alaskan Native)	304	0	23	25	0.0	7.6%	8.2%

# Low Birthweight by Maternal Age Prosperity Region 8, 2017-2021

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



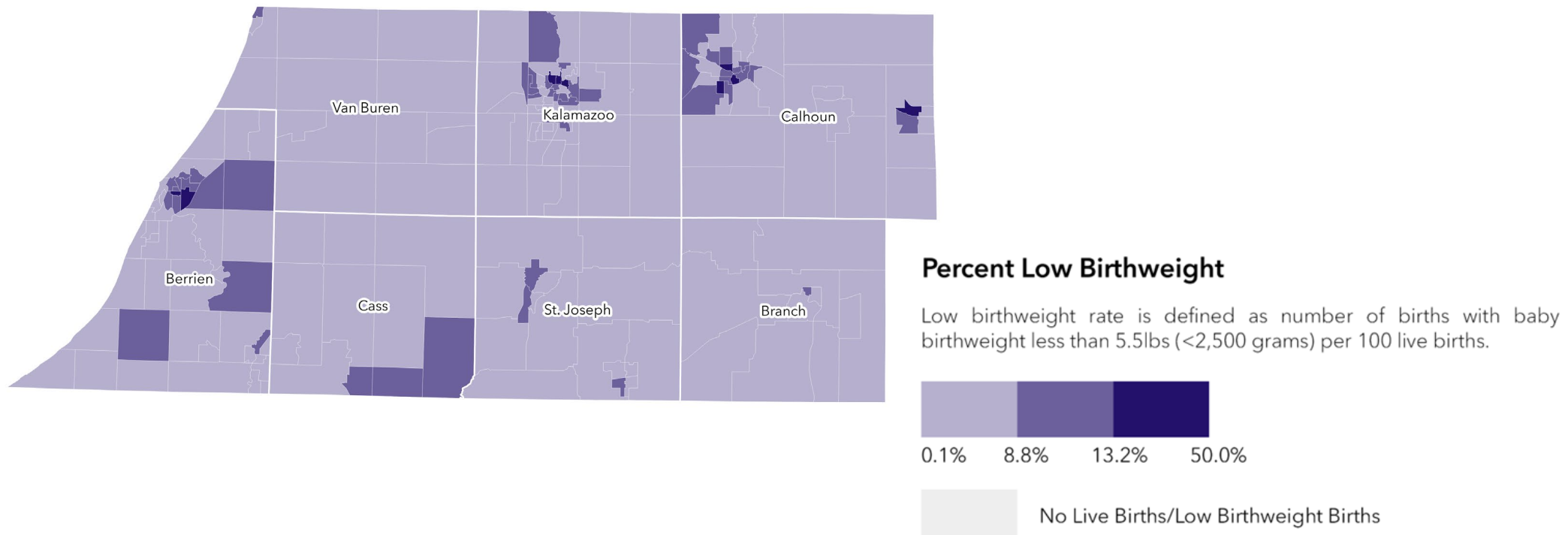
# Low Birthweight by Intended Payment Source Prosperity Region 8, 2017-2021

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

Payment	# LBW	# Live Births	Percent (%) Low Birthweight	MI
Private Insurance	1,460	20,397	7.2%	7.5%
Medicaid	1,942	20,816	9.3%	10.9%

# Low Birthweight by Census Tract Prosperity Region 8, 2016-2020

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

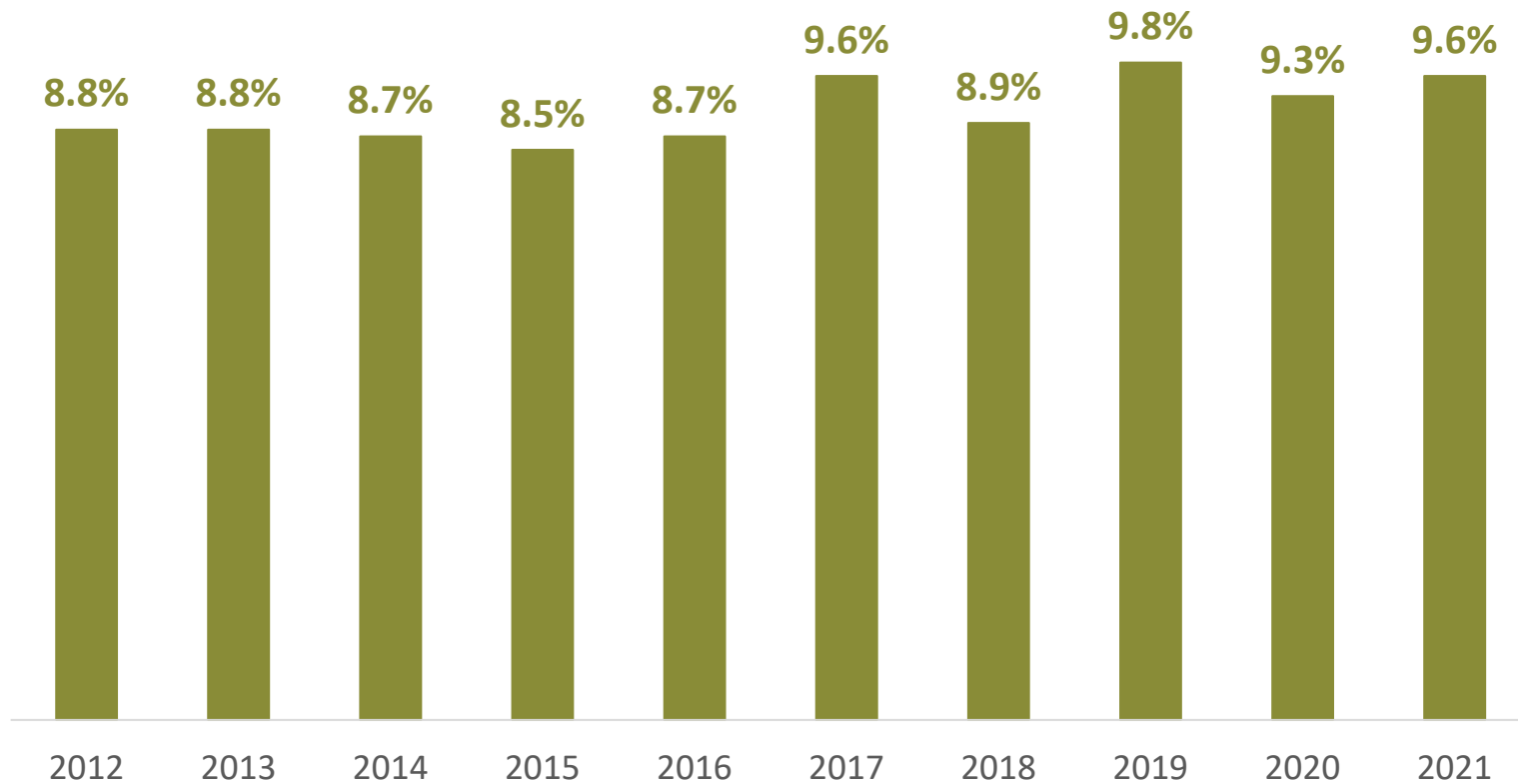


**Preterm Birth  
Prosperity Region 8  
2012-2021**



# Preterm Birth Prosperity Region 8, 2012-2021

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.



**2021 Michigan = 10.6%**

Year	# Preterm	# Births	% Preterm
2012	805	9,147	8.8%
2013	842	9,582	8.8%
2014	828	9,470	8.7%
2015	790	9,268	8.5%
2016	797	9,131	8.7%
2017	860	8,970	9.6%
2018	792	8,915	8.9%
2019	851	8,711	9.8%
2020	772	8,298	9.3%
2021	804	8,364	9.6%

# Preterm Birth by Maternal Race/Ethnicity Prosperity Region 8, 2017-2021

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.

Maternal Race	# Preterm	# Live Births	Percent (%) Preterm	MI
White non-Hispanic	2,749	31,243	8.8%	9.2%
Black non-Hispanic	846	6,103	13.9%	14.9%
Hispanic	303	3,678	8.2%	9.8%
American Indian	9	107	8.4%	10.1%
Asian/Pacific Islander	65	921	7.1%	8.2%

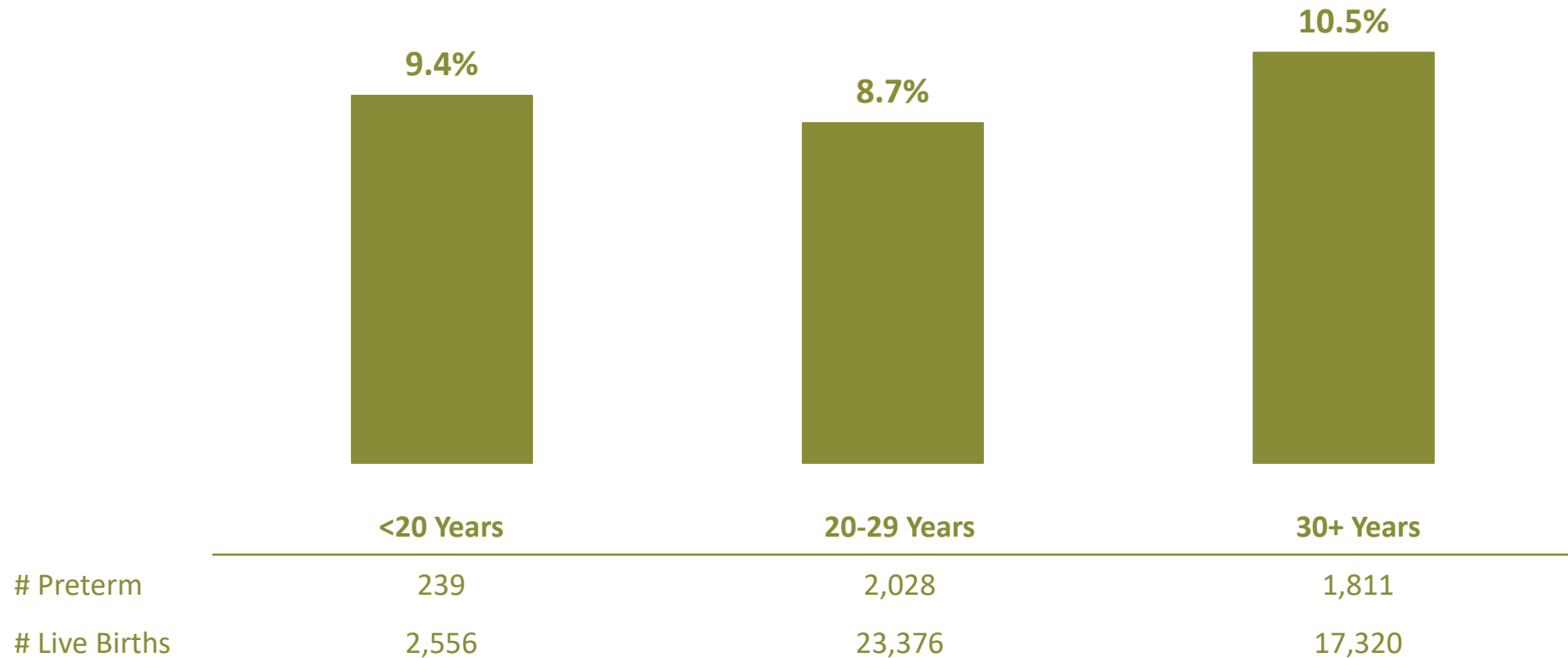
# Birth Outcomes by Race/Ethnicity Prosperity Region 8, 2017-2021

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.

Comparison of methods used to measure cases among Native Americans	# Live Births	# Infant Deaths	# Low Birthweight	# Preterm	IMR per 1,000 Live Births	% Low Birthweight	% Preterm
#1: Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	107	0	9	9	0.0	8.4%	8.4%
#2: Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	184	0	16	15	0.0	8.7%	8.2%
#3: Birthing mother is identified on the birth certificate as American Indian or Mixed race (i.e., American Indian or Alaskan Native) <b>OR</b> the father is listed as American Indian or Mixed Race (i.e., American Indian or Alaskan Native)	304	0	23	25	0.0	7.6%	8.2%

# Preterm Birth by Maternal Age Prosperity Region 8, 2017-2021

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.



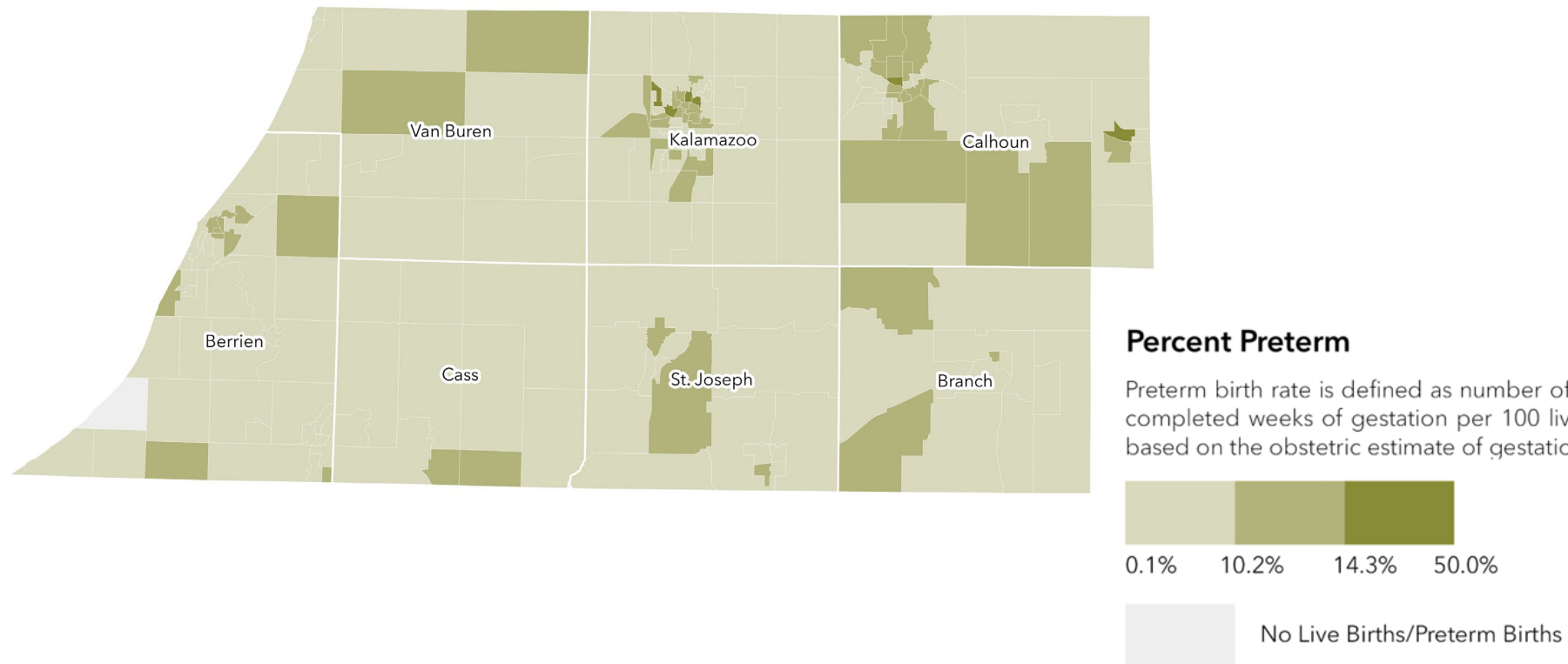
# Preterm Birth by Intended Payment Source Prosperity Region 8, 2017-2021

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.

Payment	# Preterm	# Live Births	Percent (%) Preterm	MI
Private Insurance	1,797	20,397	8.8%	9.4%
Medicaid	2,154	20,816	10.3%	11.6%

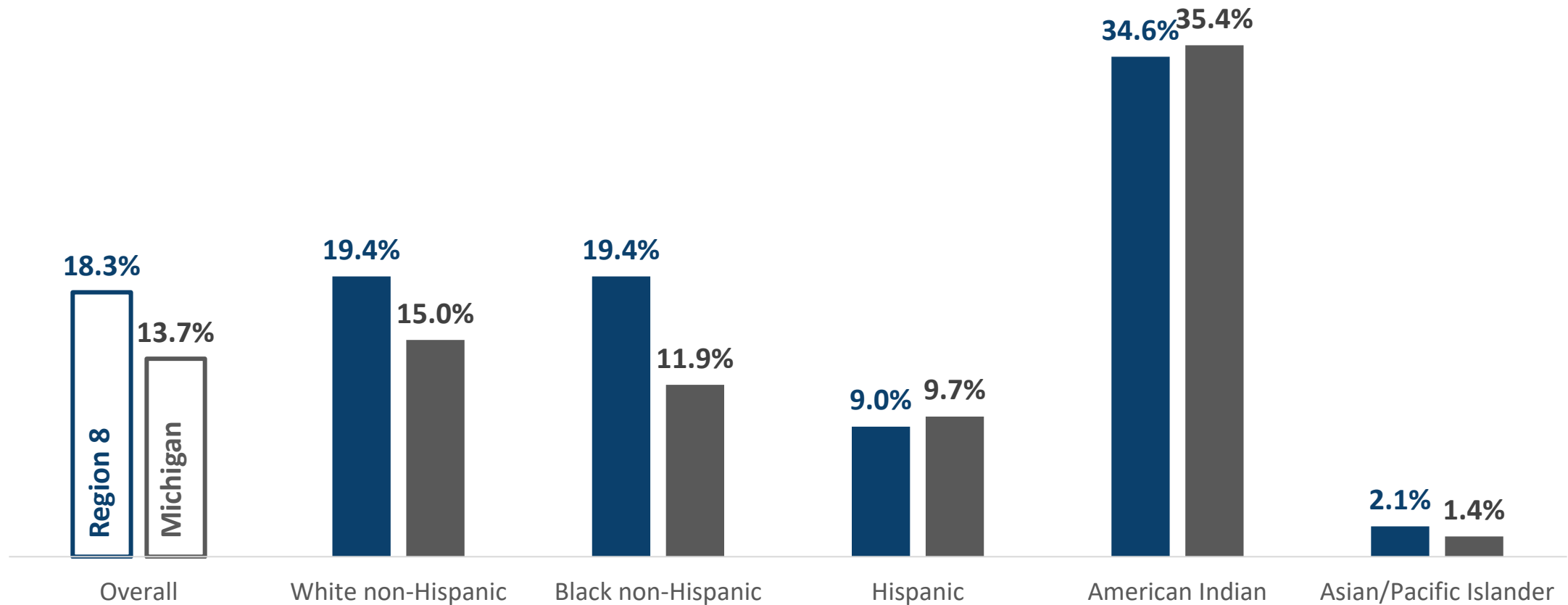
# Preterm Birth by Census Tract Prosperity Region 8, 2016-2020

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.



**Smoking During Pregnancy  
Prosperity Region 8  
2017-2021**

# Smoking During Pregnancy by Maternal Race/Ethnicity, 2017-2021





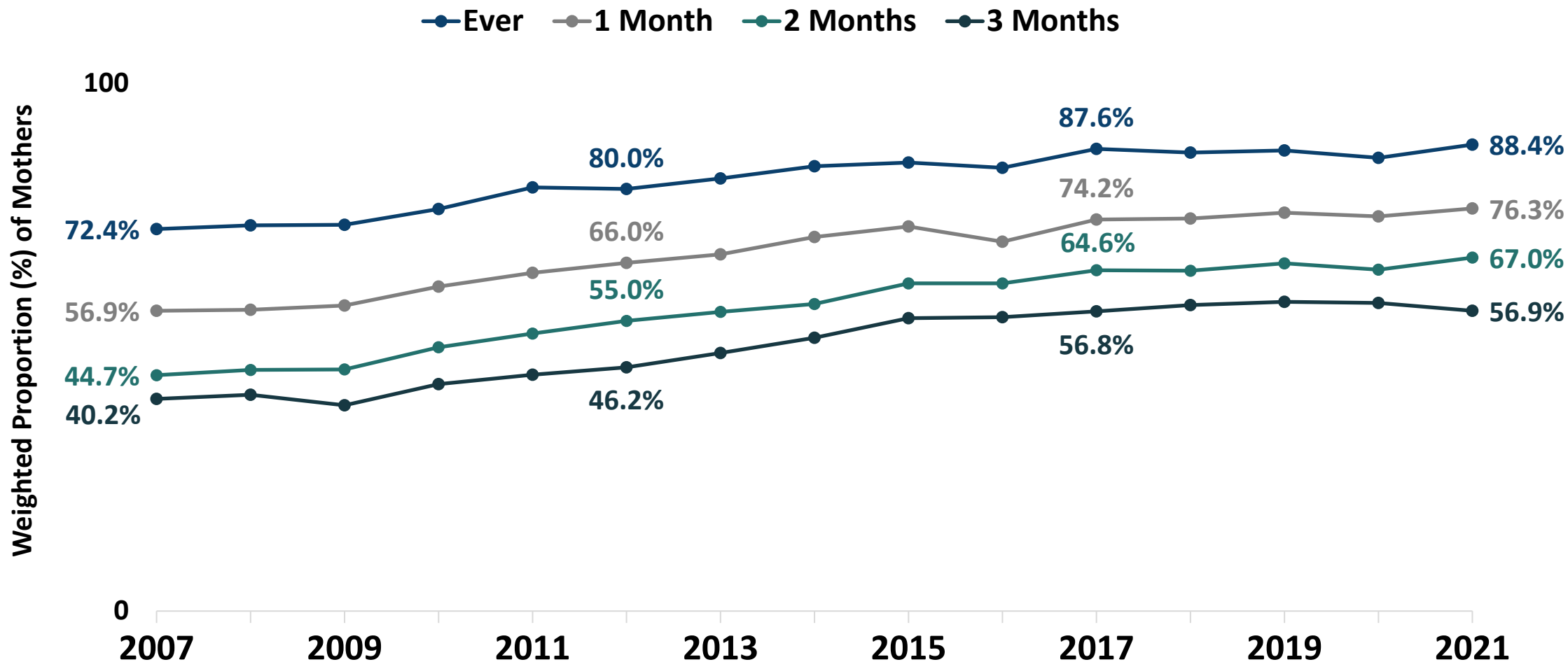
# Smoking During Pregnancy by Race/Ethnicity Prosperity Region 8, 2017-2021

Comparison of methods used to measure cases among Native Americans	# Smoke during Pregnancy	# Live Births	Percent (%) Smoke during Pregnancy
<b>#1:</b> Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	37	107	34.6%
<b>#2:</b> Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	56	184	30.4%
<b>#3:</b> Birthing mother is identified on the birth certificate as American Indian or Mixed race (i.e., American Indian or Alaskan Native) <b>OR</b> the father is listed as American Indian or Mixed Race (i.e., American Indian or Alaskan Native)	91	304	29.9%

**Breastfeeding Initiation and Duration  
Michigan  
2007-2021**

# Breastfeeding Initiation + Duration Michigan, 2007-2021

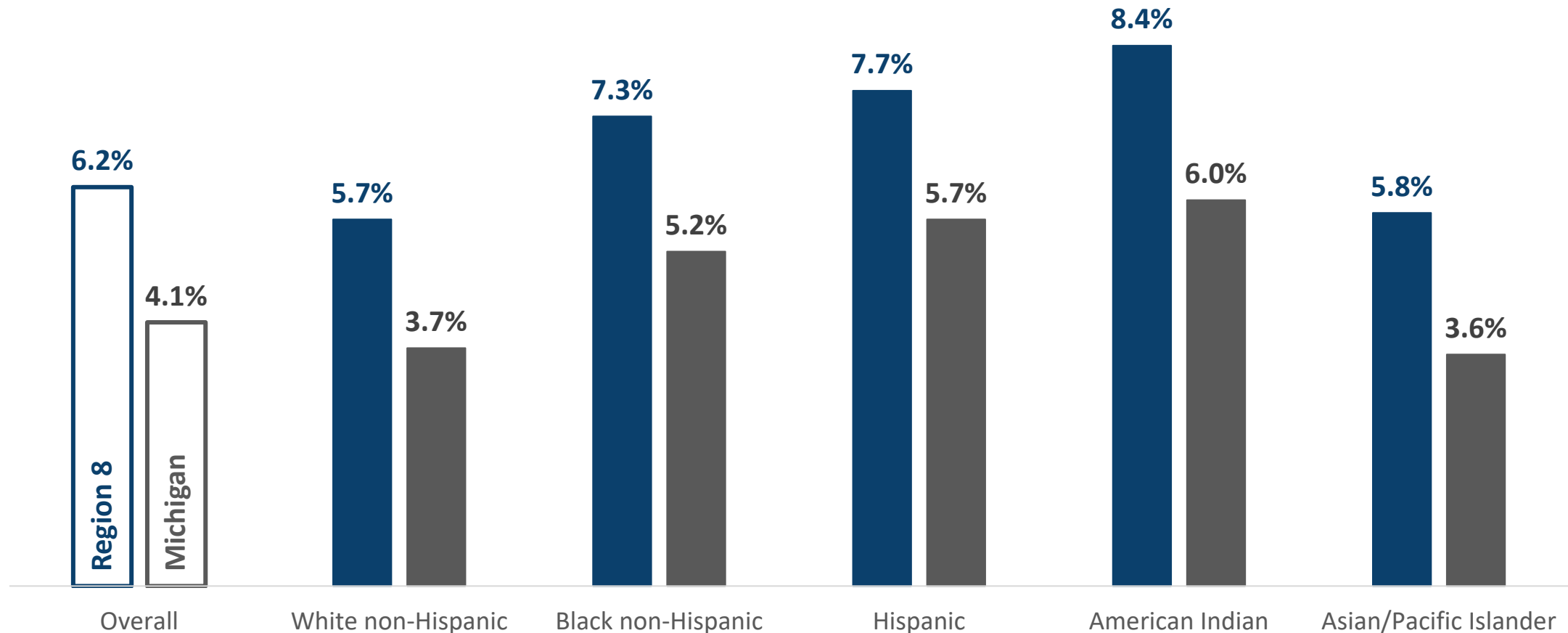
Significance test for all linear trends:  $p < 0.0001$



**Late Entry into Prenatal Care  
Prosperity Region 8  
2017-2021**

# Late Entry Into Prenatal Care by Maternal Race/Ethnicity, 2017-2021

Late entry into prenatal care refers to begin prenatal care in the 7th – 9th month of gestation



# Late Entry into Prenatal Care by Race/Ethnicity Prosperity Region 8, 2017-2021

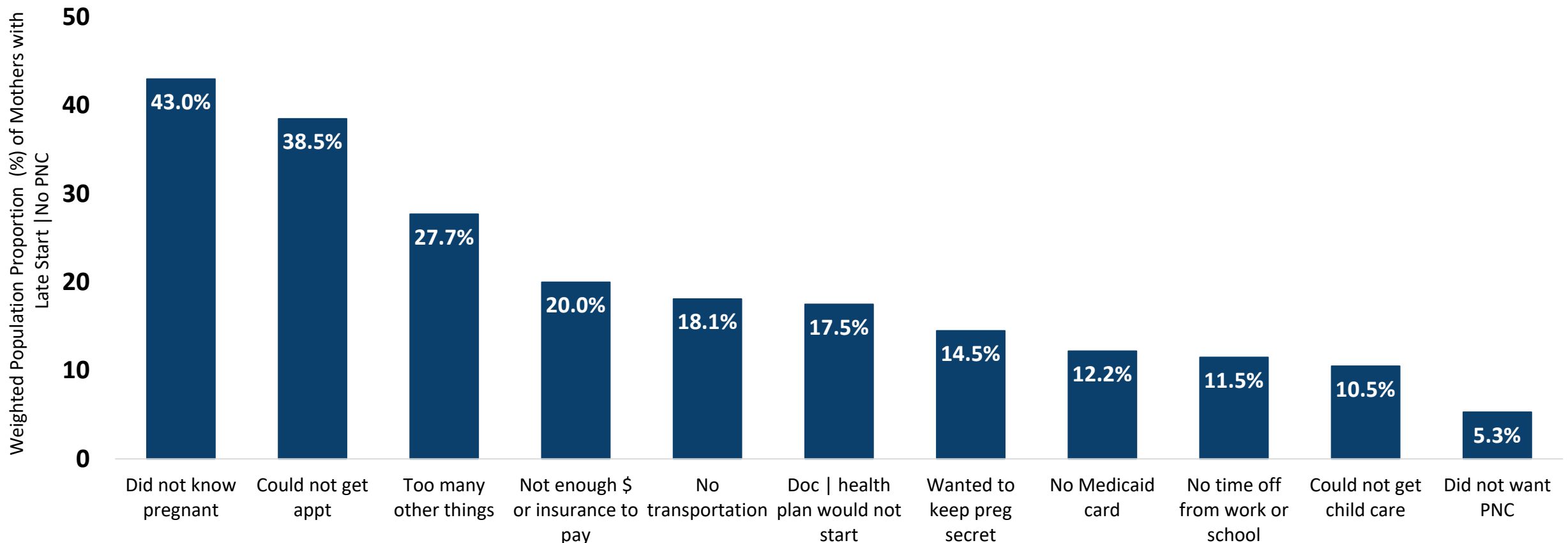
Late entry into prenatal care refers to begin prenatal care in the 7th – 9th month of gestation

Comparison of methods used to measure cases among Native Americans	# Late entry into prenatal care	# Live Births	Percent (%) late entry into prenatal care
<b>#1:</b> Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	9	107	8.4%
<b>#2:</b> Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	14	184	7.6%
<b>#3:</b> Birthing mother is identified on the birth certificate as American Indian or Mixed race (i.e., American Indian or Alaskan Native) <b>OR</b> the father is listed as American Indian or Mixed Race (i.e., American Indian or Alaskan Native)	18	304	5.9%

**Barriers to Prenatal Care  
Michigan  
2016-2021**

# Barriers to Prenatal Care among Michigan Mothers who started PNC *after* 1st trimester and wanted to start sooner, 2016-2021

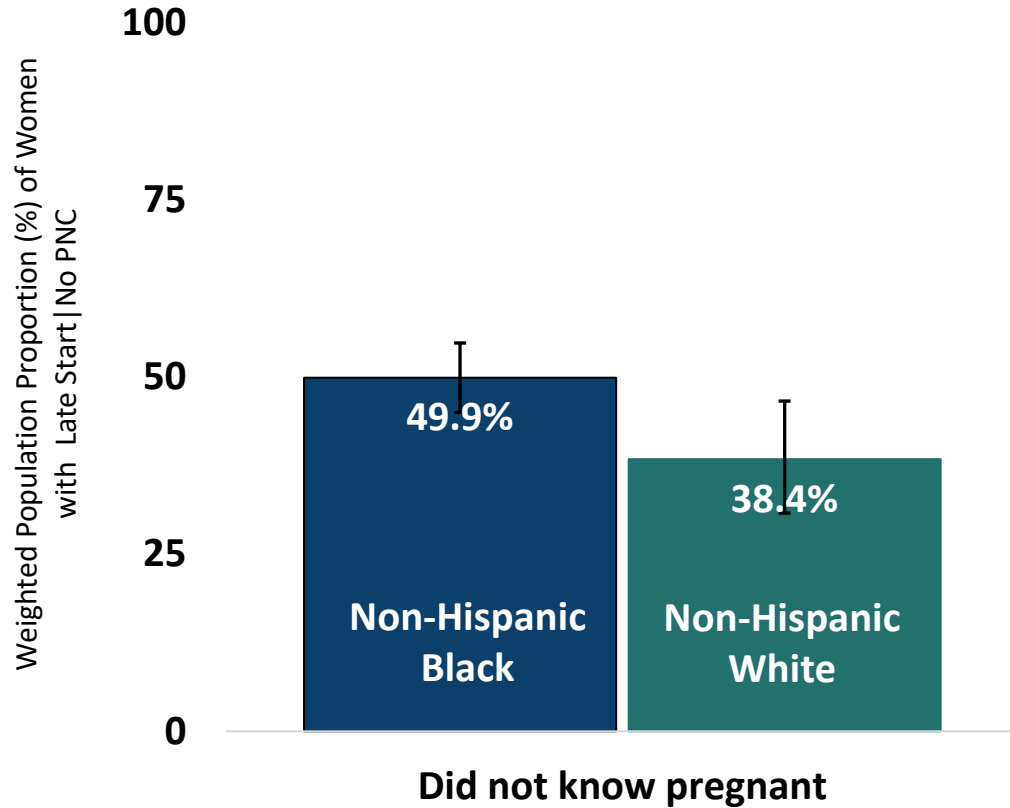
Around half (51.7%) of mothers who started PNC after the first trimester were okay with that timing.



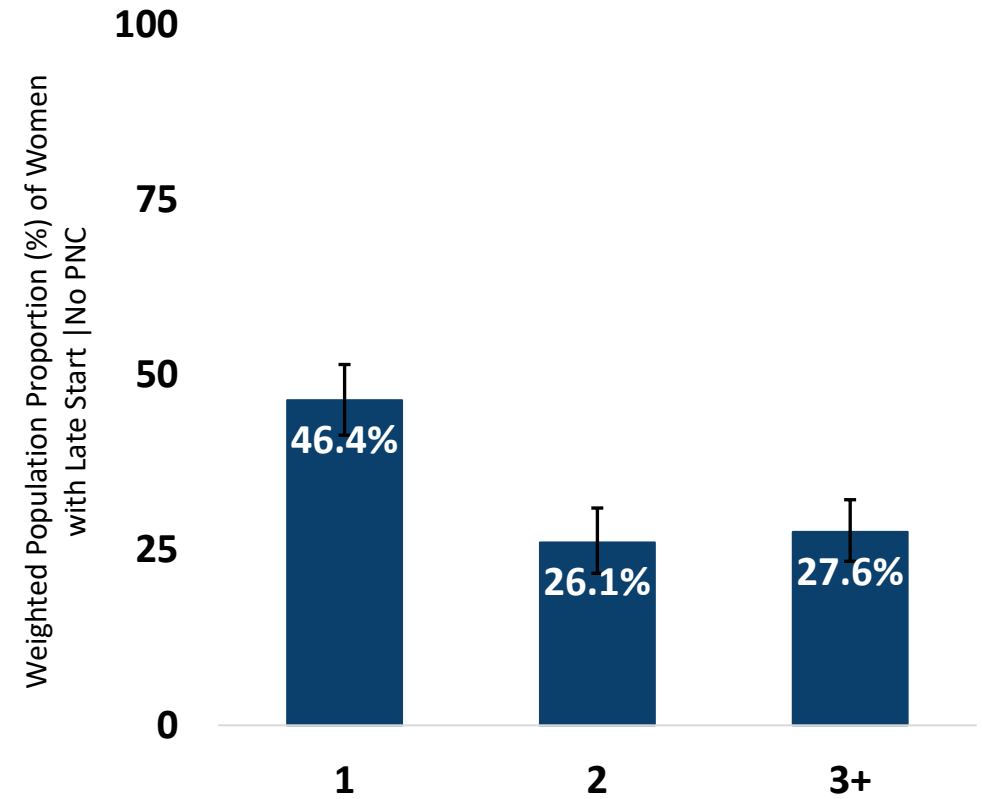


# Barriers to Prenatal Care among Michigan Mothers who started PNC *after* 1st trimester and wanted to start sooner, 2016-2021

## Selected Barriers with Significant Differences by Maternal Race/Ethnicity



## Number of Barriers among Mothers with Late | No PNC



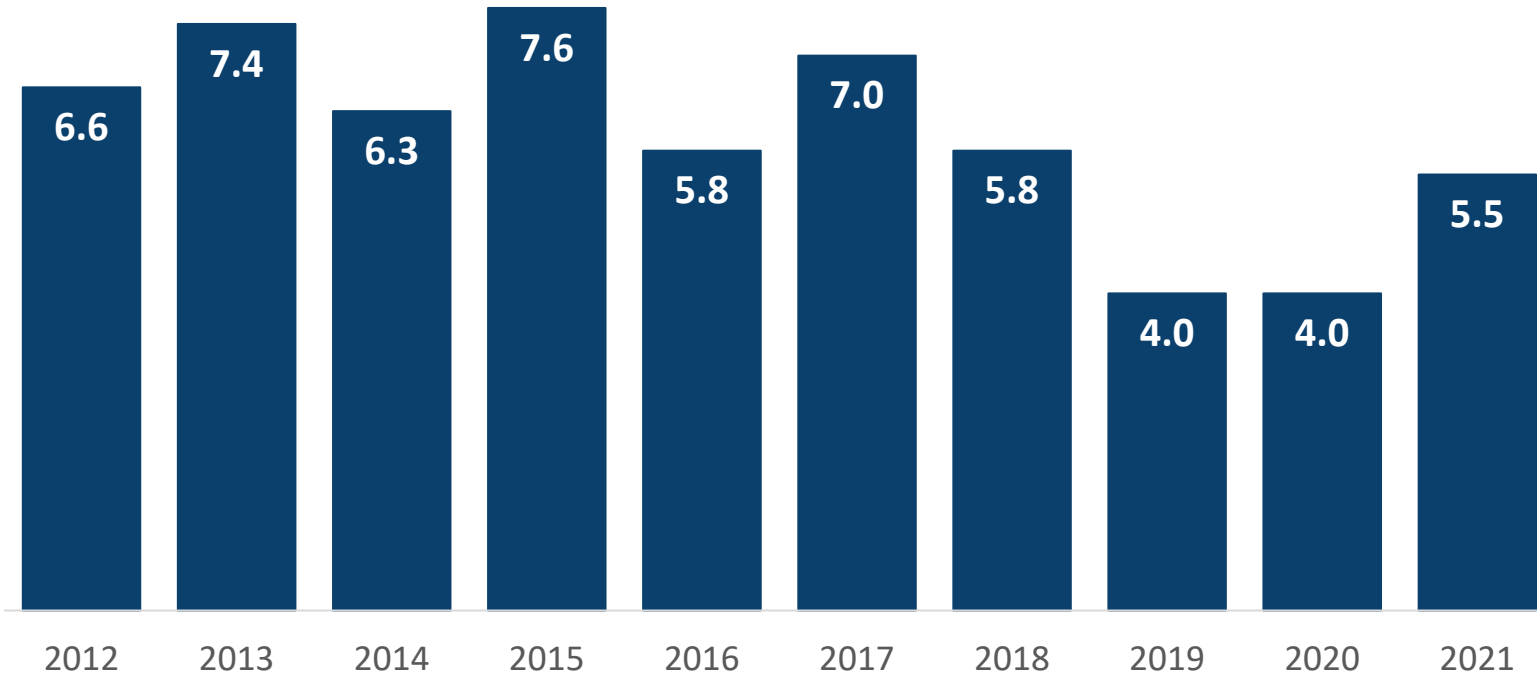
**Neonatal Abstinence Syndrome  
Prosperity Region 8  
2012-2021**

# About the Data

1. NAS cases are identified by diagnosis code (ICD-9 779.5 or ICD-10 P96.1) from the Michigan Inpatient Database. The transition from ICD-9 to ICD-10 started in Fall 2015. This may contribute to some fluctuation in the data.
2. NAS cases may be underreported with the increasing popularity of non-pharmacological interventions, which may not be consistently captured in the data.
3. The goal of NAS surveillance is *not* to reduce the number of cases to zero. This is due to limitations with current surveillance practices. They do not allow us to distinguish between a) women with untreated opioid use or other substance use disorder or b) women with opioid use disorder on medicated assisted therapy, or c) women on long term opioid, benzodiazepine or barbiturate therapy for a chronic disease condition.
4. NAS rates are calculated per 1,000 live births in order to be consistent with the CSTE case definition. Previous reports published by MDHHS include NAS rates per 100,000 live births.

# Neonatal Abstinence Syndrome Prosperity Region 8, 2012-2021

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






**2021 Michigan Rate = 6.5**

Year	# NAS Cases	# Births	Rate per 1,000 Live Births
2012	60	9,147	6.6
2013	71	9,582	7.4
2014	60	9,470	6.3
2015	70	9,268	7.6
2016	53	9,131	5.8
2017	63	8,970	7.0
2018	52	8,915	5.8
2019	35	8,711	4.0
2020	33	8,298	4.0
2021	46	8,364	5.5

# NAS by Maternal Race/Ethnicity Prosperity Region 8, 2017-2021

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

Maternal Race	# Cases	# Live Births		NAS Rate per 1,000 Live Births	MI
White non-Hispanic	185	31,243	5.9	 5.9	8.1
Black non-Hispanic	25	6,103	4.1	 4.1	3.6
Hispanic	10	3,678	2.7	 2.7	5.2
American Indian	0<N<6	107	Data Not Sufficient		46.9
Asian/Pacific Islander	0	921	0		0.3

# Neonatal Abstinence Syndrome by Race/Ethnicity Prosperity Region 8, 2017-2021

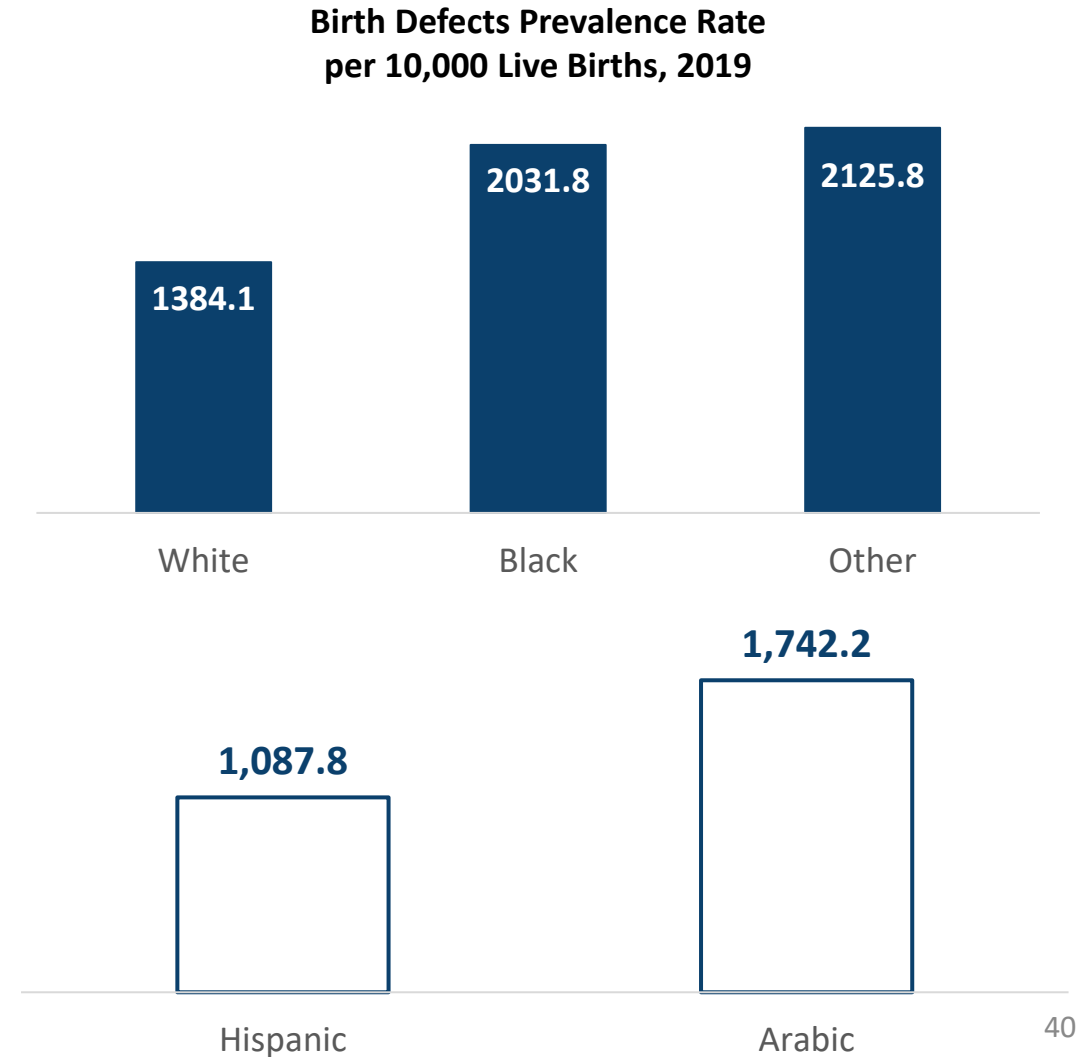
2010-2015: 779.5 (drug withdrawal syndrome in newborn) and  
2016-current: P96.1 (neonatal withdrawal symptoms from maternal use of drugs of addiction)

Comparison of methods used to measure cases among Native Americans	# NAS Cases	# Live Births	Rate per 1,000 Live Births
<b>#1:</b> Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	0<N<6	107	Data Not Sufficient
<b>#2:</b> Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	0<N<6	184	Data Not Sufficient
<b>#3:</b> Birthing mother is identified on the birth certificate as American Indian or Mixed race (i.e., American Indian or Alaskan Native) <b>OR</b> the father is listed as American Indian or Mixed Race (i.e., American Indian or Alaskan Native)	0<N<6	304	Data Not Sufficient

**Birth Defects  
by Maternal Race/Ethnicity &  
Prosperity Region  
2019**

# Birth Defect Prevalence by Maternal Race/ethnicity, 2019

- Throughout birth years 2013-2019, the birth defect prevalence rate for Michigan remained fairly steady at an average rate of 1,444.1 cases per 10,000 live births.
- In 2019, the race-specific birth defect prevalence rate for cases born to mothers of “other” races (2125.8 per 10,000 live births) exceeded that of cases born to black mothers (2031.8 cases per 10,000 live births) and cases born to white mothers (1,384.1 cases per 10,000 live births).
- In 2019, 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 (1,406.5 cases per 10,000 live births).



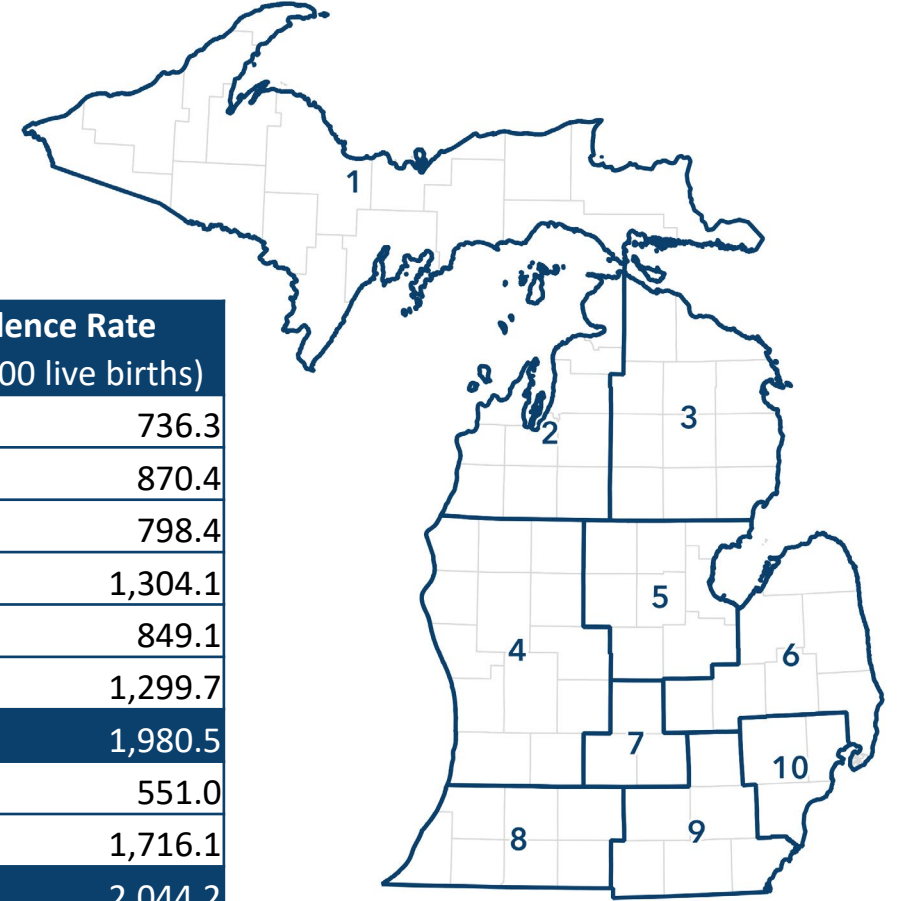


# Birth Defect Prevalence Rates by Prosperity Region, 2019

Prevalence rates are based on births to mothers living in Michigan at the time of delivery. Regions approximate prosperity region boundaries

- The State of Michigan is broken up into 10 prosperity regions based on shared geographic, demographic, and economic interests.
- In 2019, Michigan prosperity regions 7 and 10 reported the highest birth defect prevalence rates of 1,980.5 and 2,044.2 cases per 10,000 live births respectively.
- The prosperity region that reported the lowest birth defect prevalence was region 8 with a prevalence rate of 551.0 cases per 10,000 live births.

Region	# Cases	Prevalence Rate (per 10,000 live births)
1	184	736.3
2	235	870.4
3	135	798.4
4	2,400	1,304.1
5	480	849.1
6	1,145	1,299.7
7	976	1,980.5
8	480	551.0
9	1,707	1,716.1
10	9,112	2,044.2
<b>Total</b>	<b>16,854</b>	<b>1,561.8</b>



**Low Risk Cesarean  
Prosperity Region 8  
2017-2021**

# Low Risk Cesarean by Maternal Race/Ethnicity Prosperity Region 8, 2017-2021

Low risk cesarean is a ratio of the number of first births delivered by cesarean section to low risk females (full-term, singleton births, vertex presentation) to the number of first births to low-risk females (full-term, singleton births, vertex presentation)

Maternal Race	# Low Risk Cesarean	# Low Risk Live Birth	Percent (%) Low Risk Cesarean
Overall	2,597	10,856	23.9%
White non-Hispanic	1,907	8,101	23.5%
Black non-Hispanic	332	1,289	25.8%
Hispanic	200	844	23.7%
American Indian	0<N<6	31	Data Not Sufficient
Asian/Pacific Islander	69	251	27.5%

# Low Risk Cesarean by Race/Ethnicity Prosperity Region 8, 2017-2021

Low risk cesarean is a ratio of the number of first births delivered by cesarean section to low risk females (full-term, singleton births, vertex presentation) to the number of first births to low-risk females (full-term, singleton births, vertex presentation)

Comparison of methods used to measure cases among Native Americans	# Low Risk Cesarean	# Low Risk Live Births	Percent (%) cesarean among low-risk females with no prior birth
#1: Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	0<N<6	31	Data Not Sufficient
#2: Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	12	50	24.0%
#3: Birthing mother is identified on the birth certificate as American Indian or Mixed race (i.e., American Indian or Alaskan Native) <b>OR</b> the father is listed as American Indian or Mixed Race (i.e., American Indian or Alaskan Native)	22	88	25.0%

**Sleep-Related Infant Death Rate  
Prosperity Region 8  
2010-2020**

# Overview of Sleep-Related Infant Deaths Michigan, 2010-2020

- Between 2010 and 2020 there were **1,597** 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 2020 Black Infants were **3.8** times more likely to die of sleep-related causes as compared to white Infants. American Indian infants were **2.5** 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

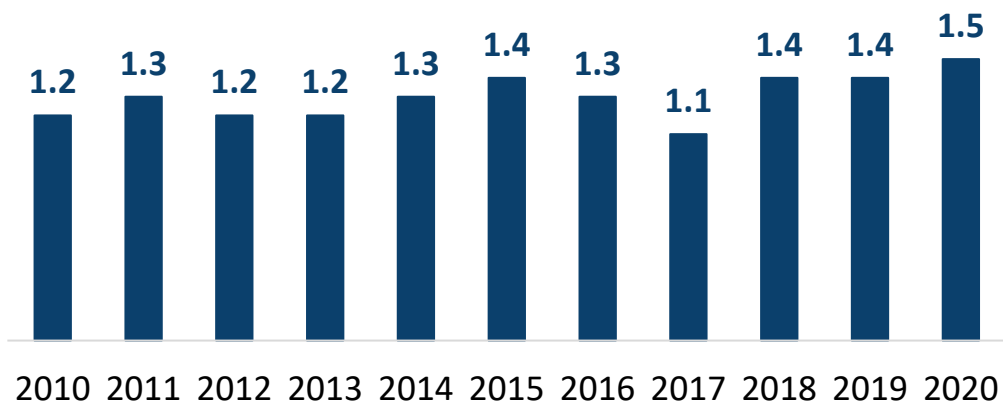
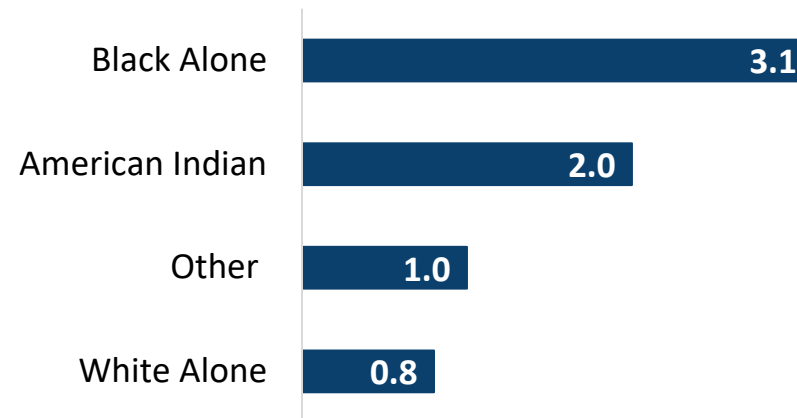


Figure 2. Rate of Sleep-Related Infant Deaths  
per 1,000 Live Births

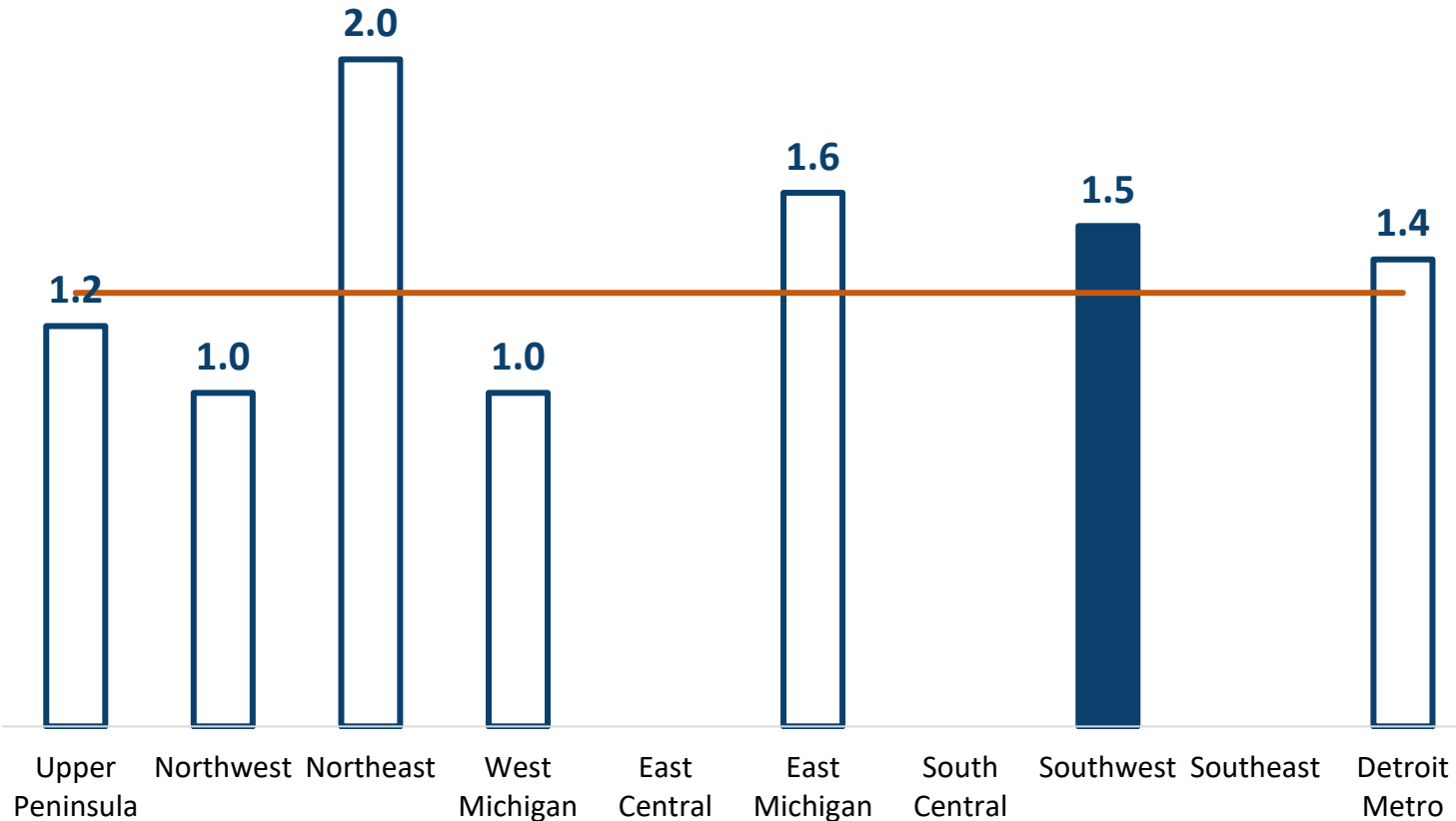


# Sleep-Related Infant Death Rate by Prosperity Region, 2010-2020

Data for regions 5, 7, and 9 suppressed as to not inadvertently identify suppressed county level statistics.

Sleep-Related Infant Death Rate per 1,000 Live Births

Michigan: 1.3



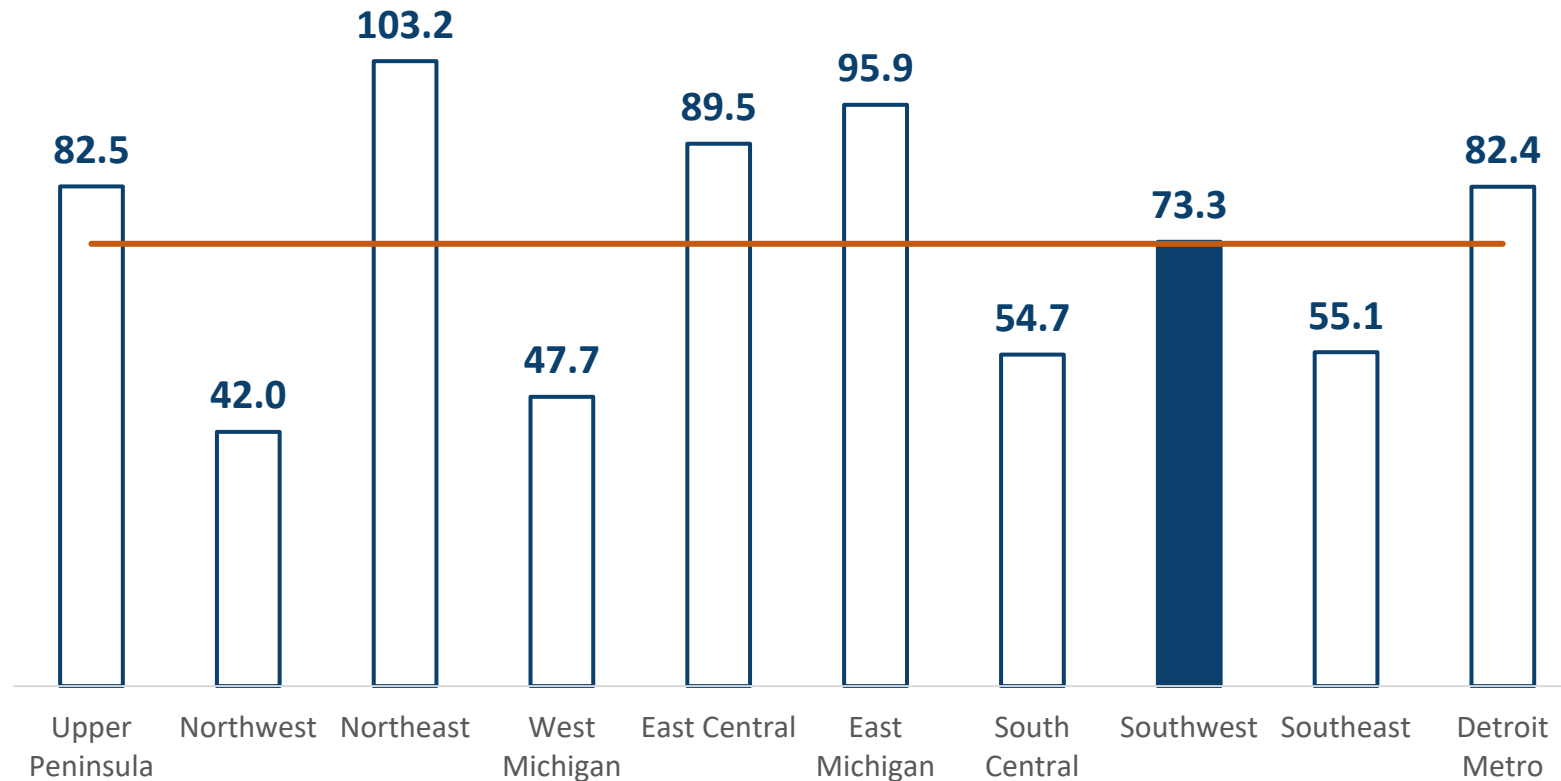
- Between 2010 and 2020 there were **151** sleep-related infant deaths in Region Eight.
- The Region Eight sleep-related infant death rate was higher than the Michigan sleep-related infant death rate, but this difference was not statistically significant.

**Maternal Mortality Ratio  
Prosperity Region 8  
2015-2019**



# Maternal Mortality Ratio by Prosperity Region, 2015-2019

Total (Pregnancy Associated) Maternal Mortality Ratio  
per 100,000 Live Births  
**Michigan Ratio : 73.0**

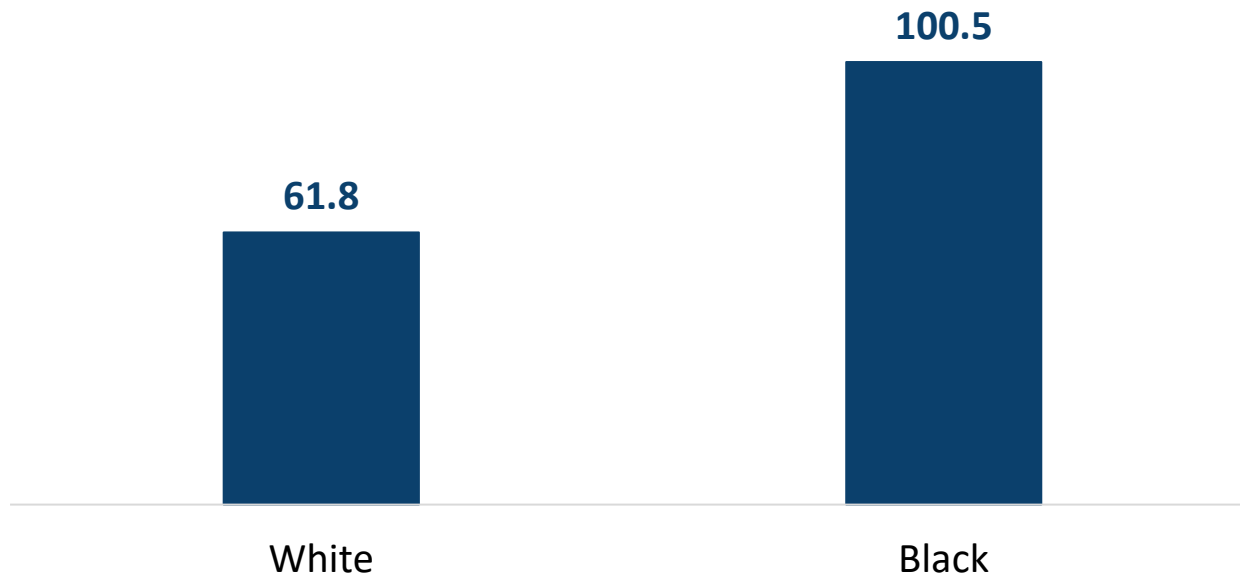


- Maternal deaths include deaths that occur during pregnancy, at delivery or within one year of pregnancy.
- Pregnancy associated (total) maternal mortality includes:
  - 1- pregnancy associated, not related mortality (*unrelated to the pregnancy*),
  - 2- pregnancy-related mortality (*related to or aggravated by the pregnancy*),
  - 3- deaths where pregnancy-relatedness is unable to be determined.
- In Region Eight there were **33** maternal deaths between 2015 and 2019.

# Maternal Mortality Ratio by Race Prosperity Region 8, 2015-2019

Other race and ethnicities suppressed due to sample size.

Pregnancy Associated (Total) Maternal Mortality Ratio,  
per 100,000 Live Births



Between 2015 and 2019, Black mothers in Prosperity Region Eight experienced **1.6** times higher maternal mortality as compared to white mothers.

There were **22** white maternal deaths and **7** Black maternal deaths in Prosperity Region Eight between 2015 and 2019.