



Maternal and Infant Health Statistics

Prosperity Region 9

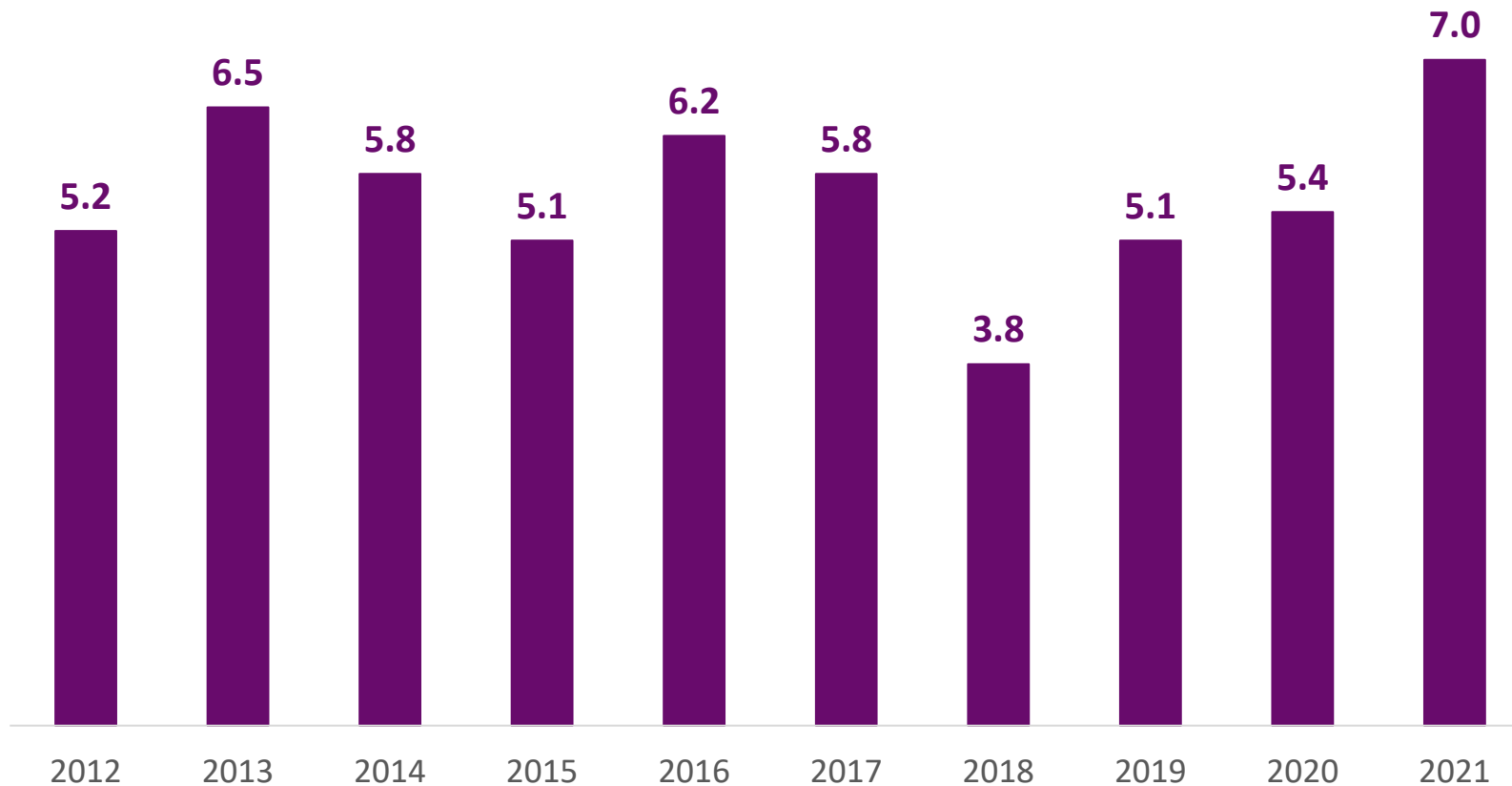
Michigan

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 9
2012-2021**

Infant Mortality Rate Prosperity Region 9, 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	54	10,297	5.2
2013	67	10,328	6.5
2014	61	10,571	5.8
2015	52	10,206	5.1
2016	65	10,471	6.2
2017	59	10,149	5.8
2018	38	10,035	3.8
2019	51	9,947	5.1
2020	52	9,660	5.4
2021	68	9,663	7.0

Infant Mortality Rates by Maternal Race/Ethnicity Prosperity Region 9, 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	39,447	4.5	4.8
Black Non-Hispanic	50	3,877	12.9	13.6
Hispanic	15	2,396	6.3	5.6
American Indian	0<N<6	85	Data Not Sufficient	5.5
Asian/Pacific Islander	8	2,005	4.0	4.5

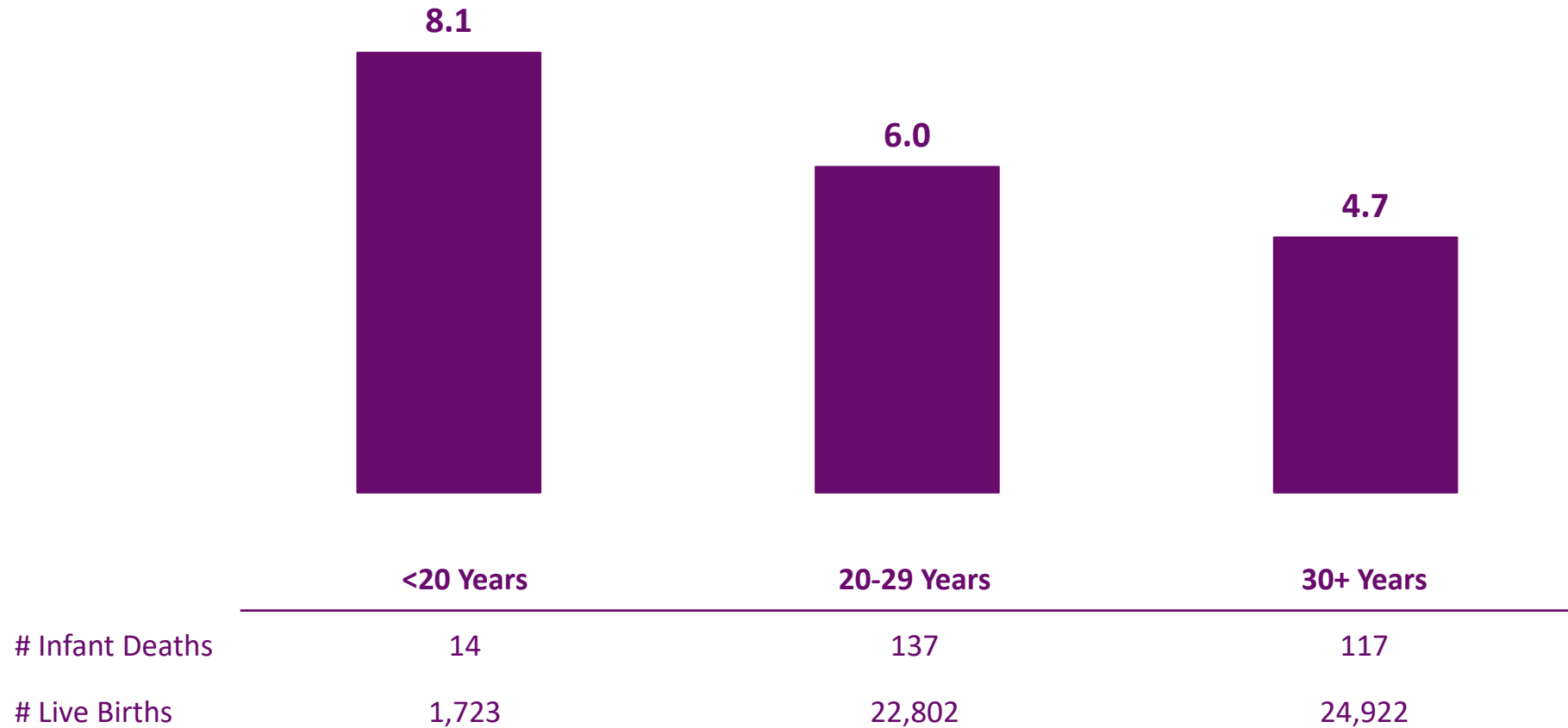
Birth Outcomes by Race/Ethnicity Prosperity Region 9, 2017-2021

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
#1: Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	85	0<N<6	11	15	Data Not Sufficient	12.9%	17.6%
#2: Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	180	0<N<6	18	33	Data Not Sufficient	10.0%	18.3%
#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)	322	0<N<6	25	44	Data Not Sufficient	7.8%	13.7%

Infant Mortality Rate by Maternal Age Prosperity Region 9, 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.



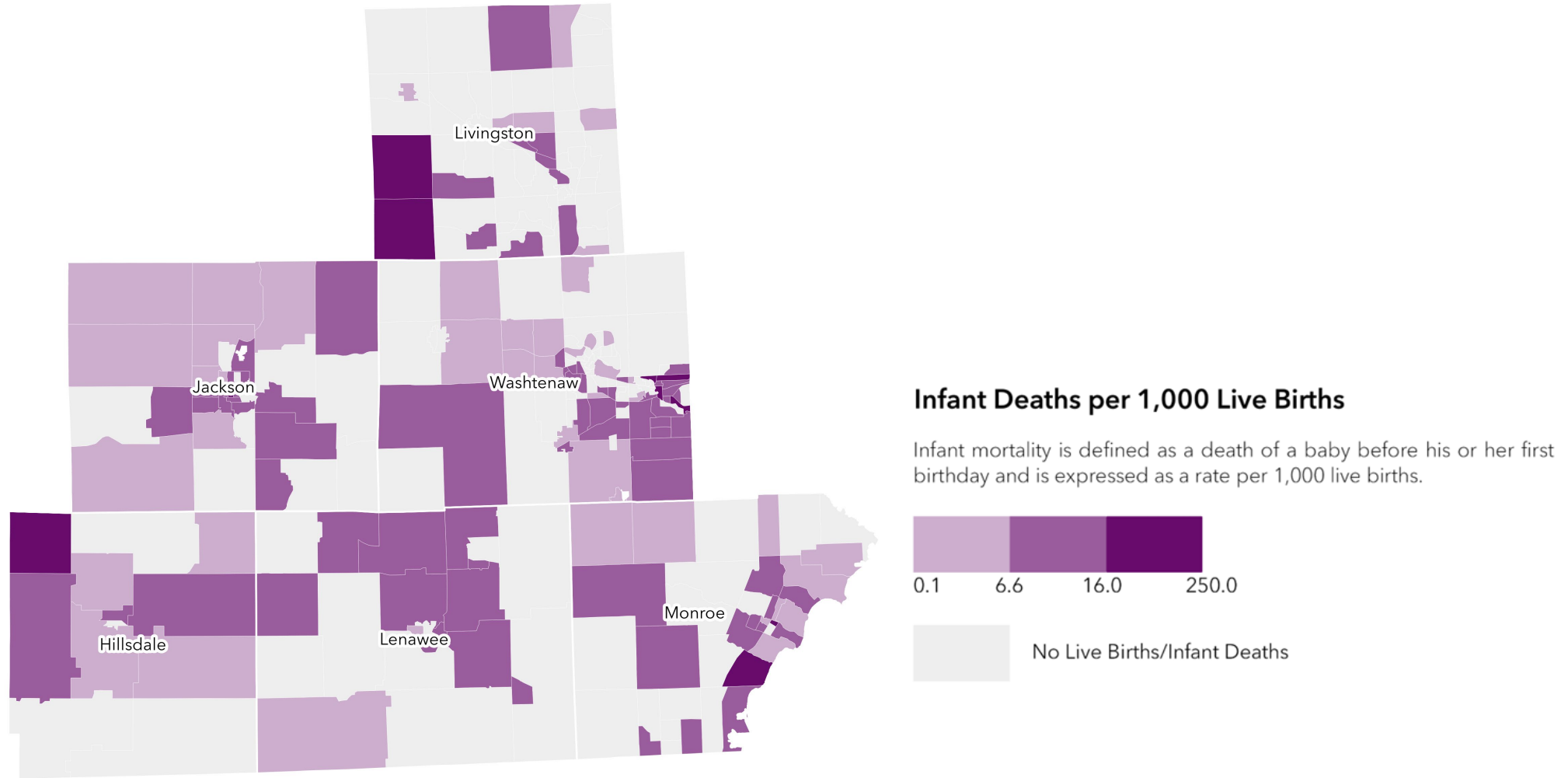
Infant Mortality Rates by Intended Payment Source Prosperity Region 9, 2017-2021

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	136	32,705	4.2	4.9
Medicaid	121	15,131	8.0	8.7

Infant Mortality Rates by Census Tract Prosperity Region 9, 2016-2020

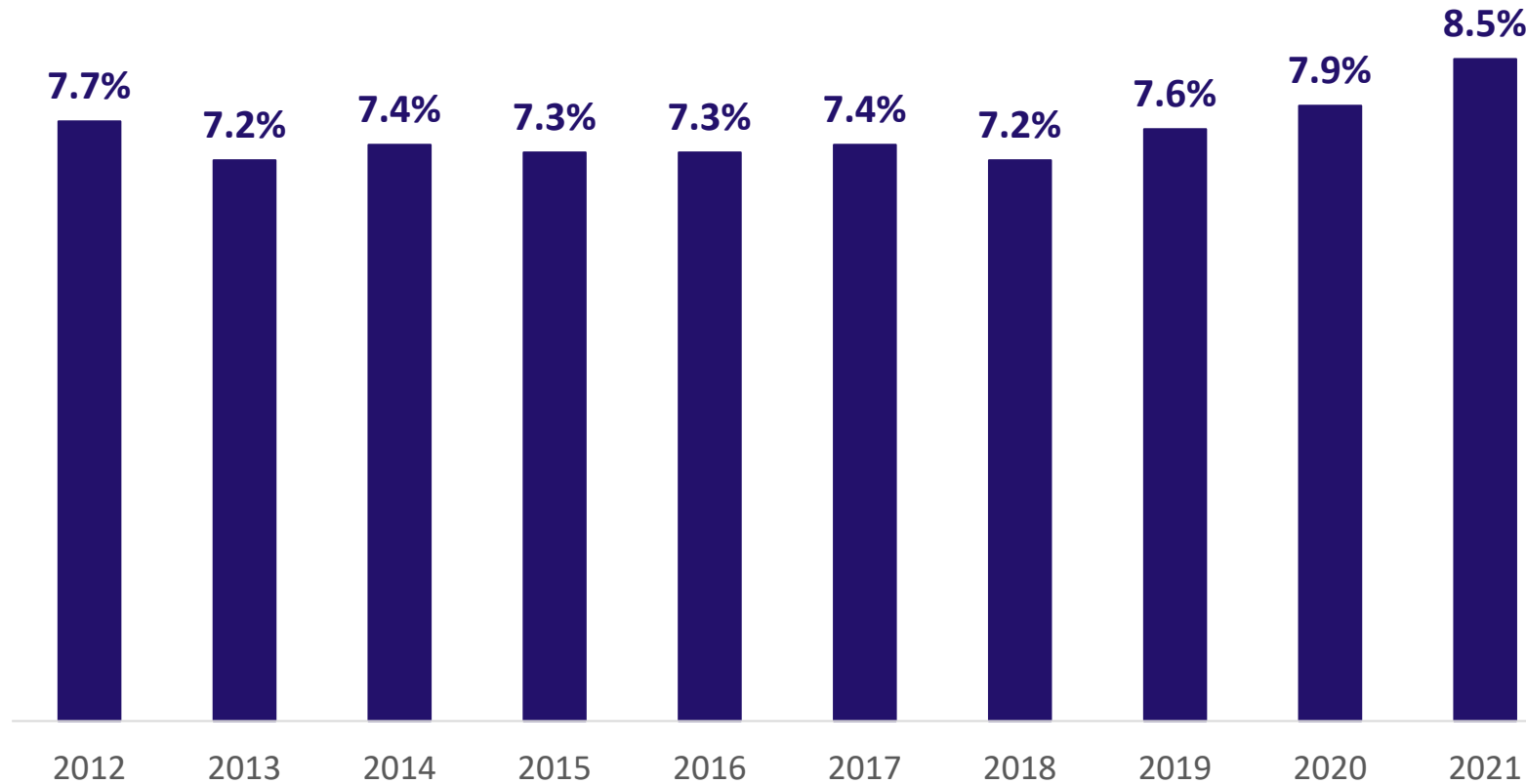
Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.



**Low Birthweight (LBW)
Prosperity Region 9
2012-2021**

Low Birthweight Prosperity Region 9, 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	795	10,297	7.7
2013	740	10,328	7.2
2014	779	10,571	7.4
2015	740	10,206	7.3
2016	765	10,471	7.3
2017	756	10,149	7.4
2018	721	10,035	7.2
2019	760	9,947	7.6
2020	760	9,660	7.9
2021	826	9,663	8.5

Low Birthweight by Maternal Race/Ethnicity Prosperity Region 9, 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	2,772	39,447	7.0%	7.2%
Black non-Hispanic	543	3,877	14.0%	15.2%
Hispanic	184	2,396	7.7%	7.7%
American Indian	11	85	12.9%	8.4%
Asian/Pacific Islander	140	2,005	7.0%	9.0%

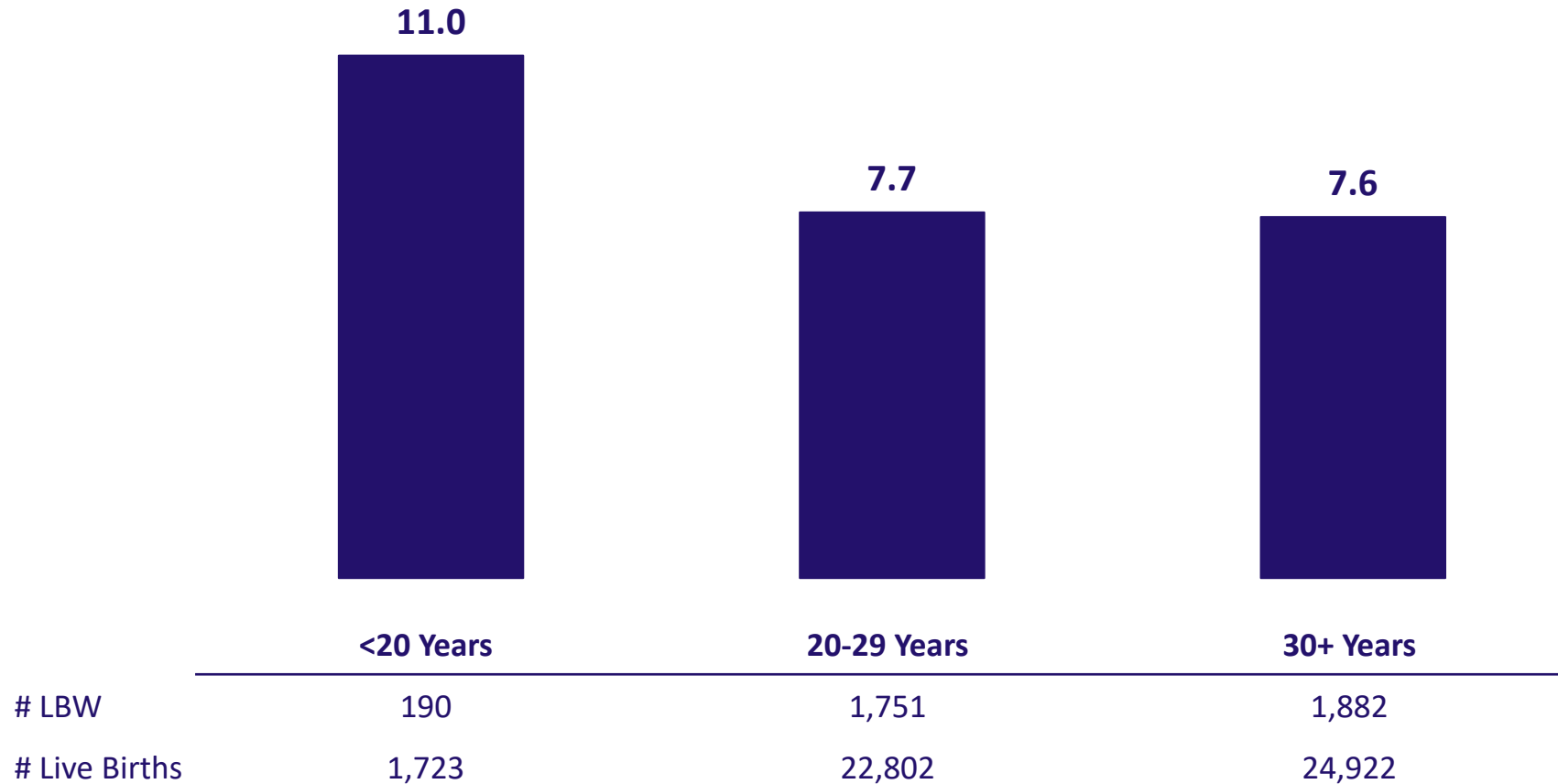
Birth Outcomes by Race/Ethnicity Prosperity Region 9, 2017-2021

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	85	0<N<6	11	15	Data Not Sufficient	12.9%	17.6%
#2: Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	180	0<N<6	18	33	Data Not Sufficient	10.0%	18.3%
#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)	322	0<N<6	25	44	Data Not Sufficient	7.8%	13.7%

Low Birthweight by Maternal Age Prosperity Region 9, 2017-2021

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



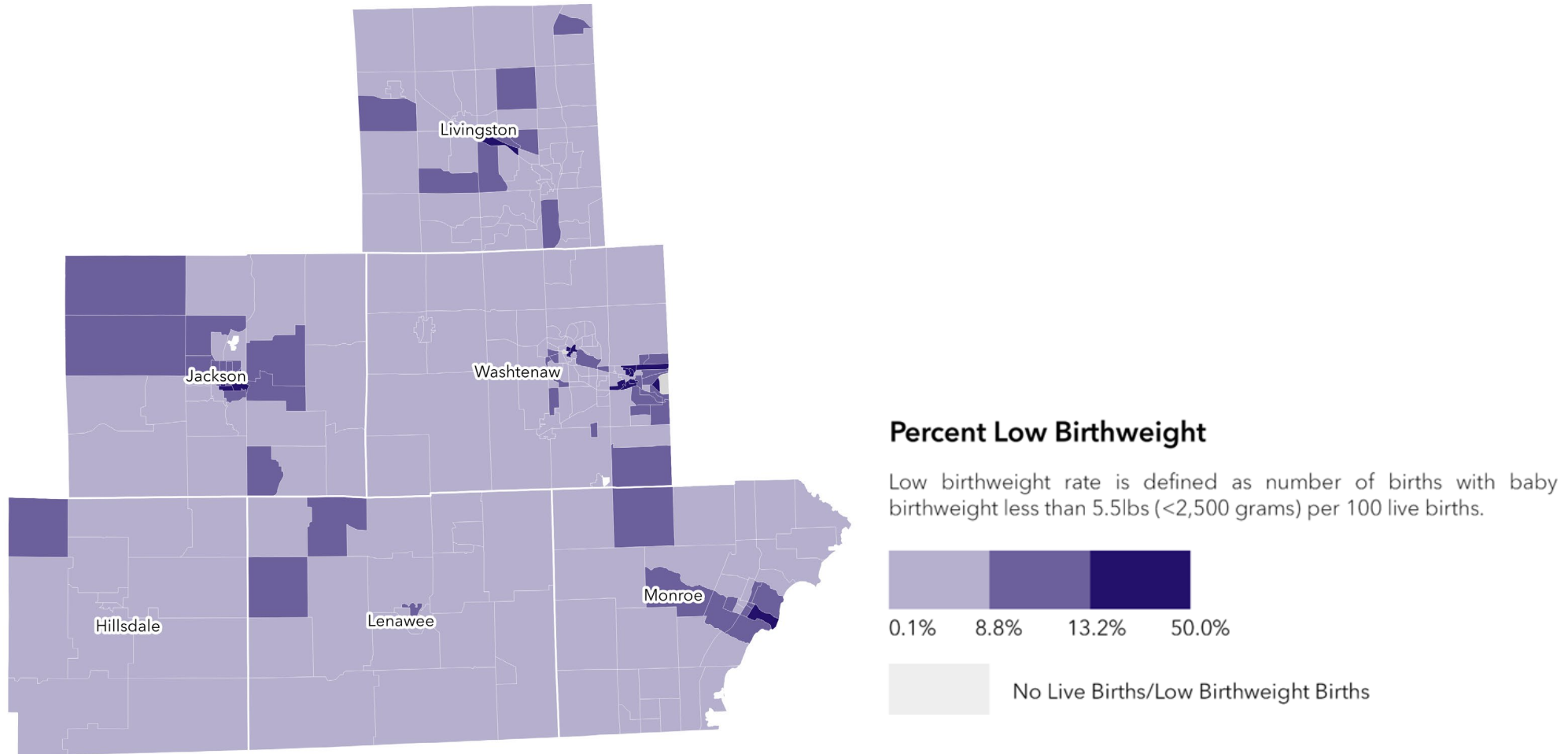
Low Birthweight by Intended Payment Source Prosperity Region 9, 2017-2021

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	2,218	32,705	6.8%	7.5%
Medicaid	1,517	15,131	10.0%	10.9%

Low Birthweight by Census Tract Prosperity Region 9, 2016-2020

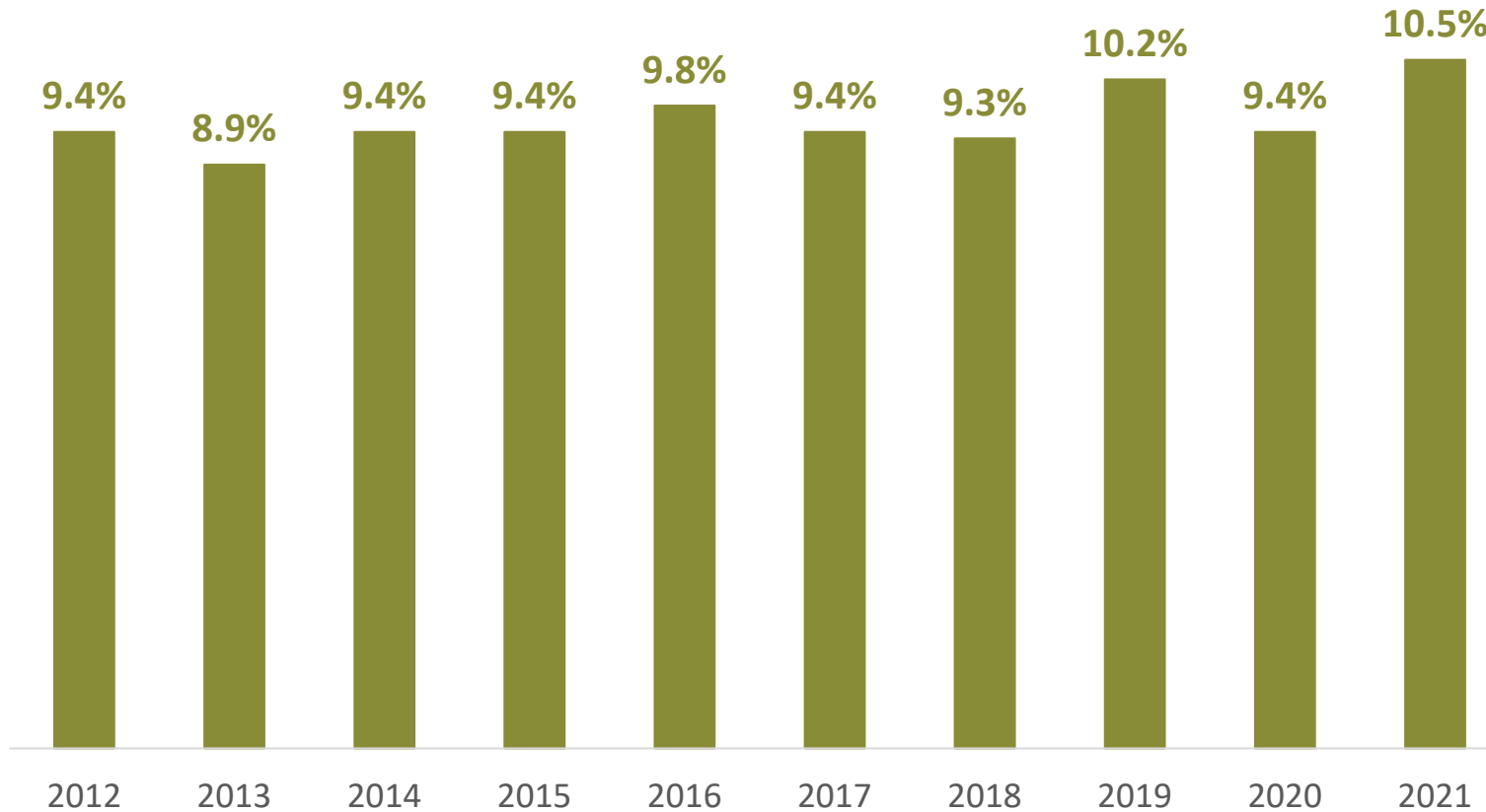
Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.



**Preterm Birth
Prosperity Region 9
2012-2021**

Preterm Birth Prosperity Region 9, 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	973	10,297	9.4
2013	917	10,328	8.9
2014	992	10,571	9.4
2015	956	10,206	9.4
2016	1,024	10,471	9.8
2017	953	10,149	9.4
2018	938	10,035	9.3
2019	1,019	9,947	10.2
2020	906	9,660	9.4
2021	1,010	9,663	10.5

Preterm Birth by Maternal Race/Ethnicity Prosperity Region 9, 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	3,683	39,447	9.3%	9.2%
Black non-Hispanic	556	3,877	14.3%	14.9%
Hispanic	236	2,396	9.8%	9.8%
American Indian	15	85	17.6%	10.1%
Asian/Pacific Islander	139	2,005	6.9%	8.2%

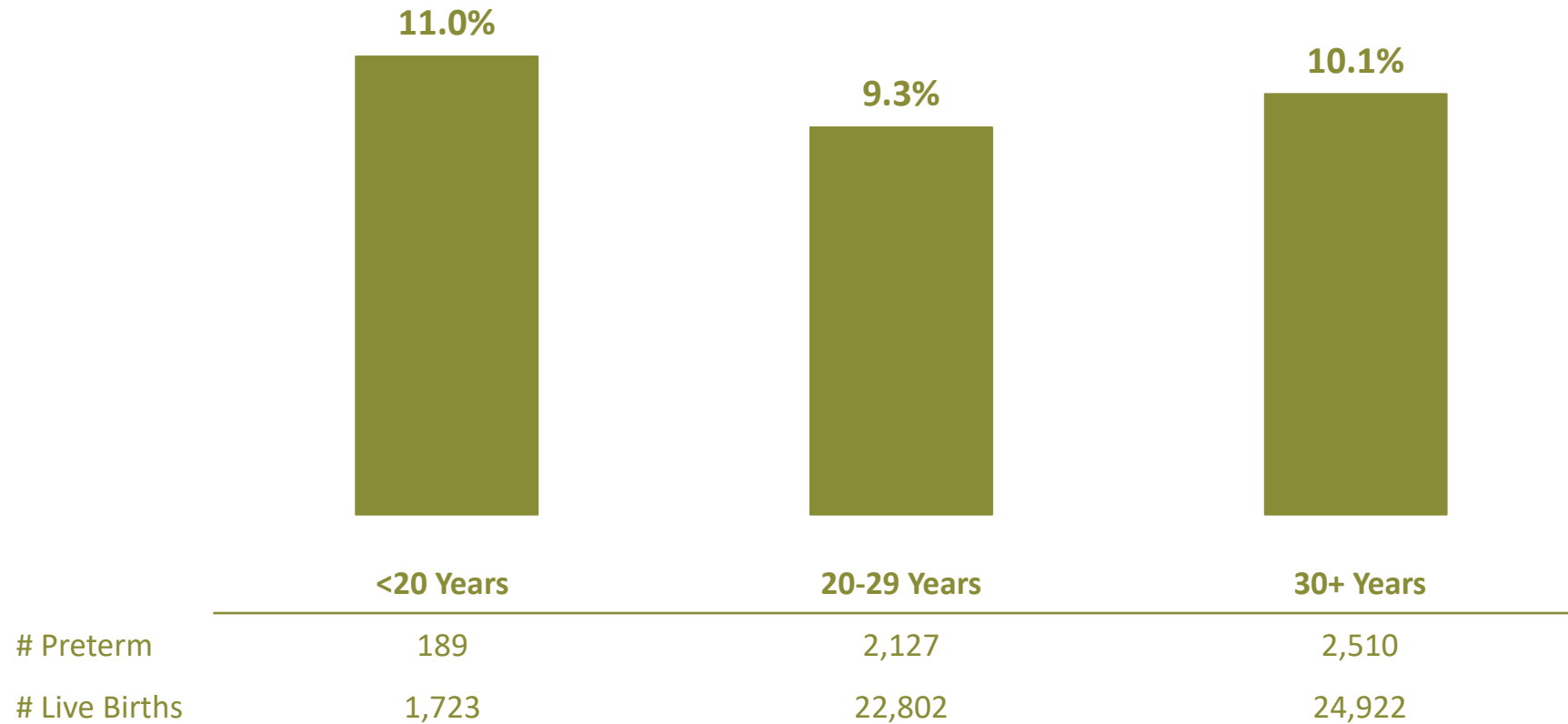
Birth Outcomes by Race/Ethnicity Prosperity Region 9, 2017-2021

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	85	0<N<6	11	15	Data Not Sufficient	12.9%	17.6%
#2: Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	180	0<N<6	18	33	Data Not Sufficient	10.0%	18.3%
#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)	322	0<N<6	25	44	Data Not Sufficient	7.8%	13.7%



Preterm Birth by Maternal Age Prosperity Region 9, 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.



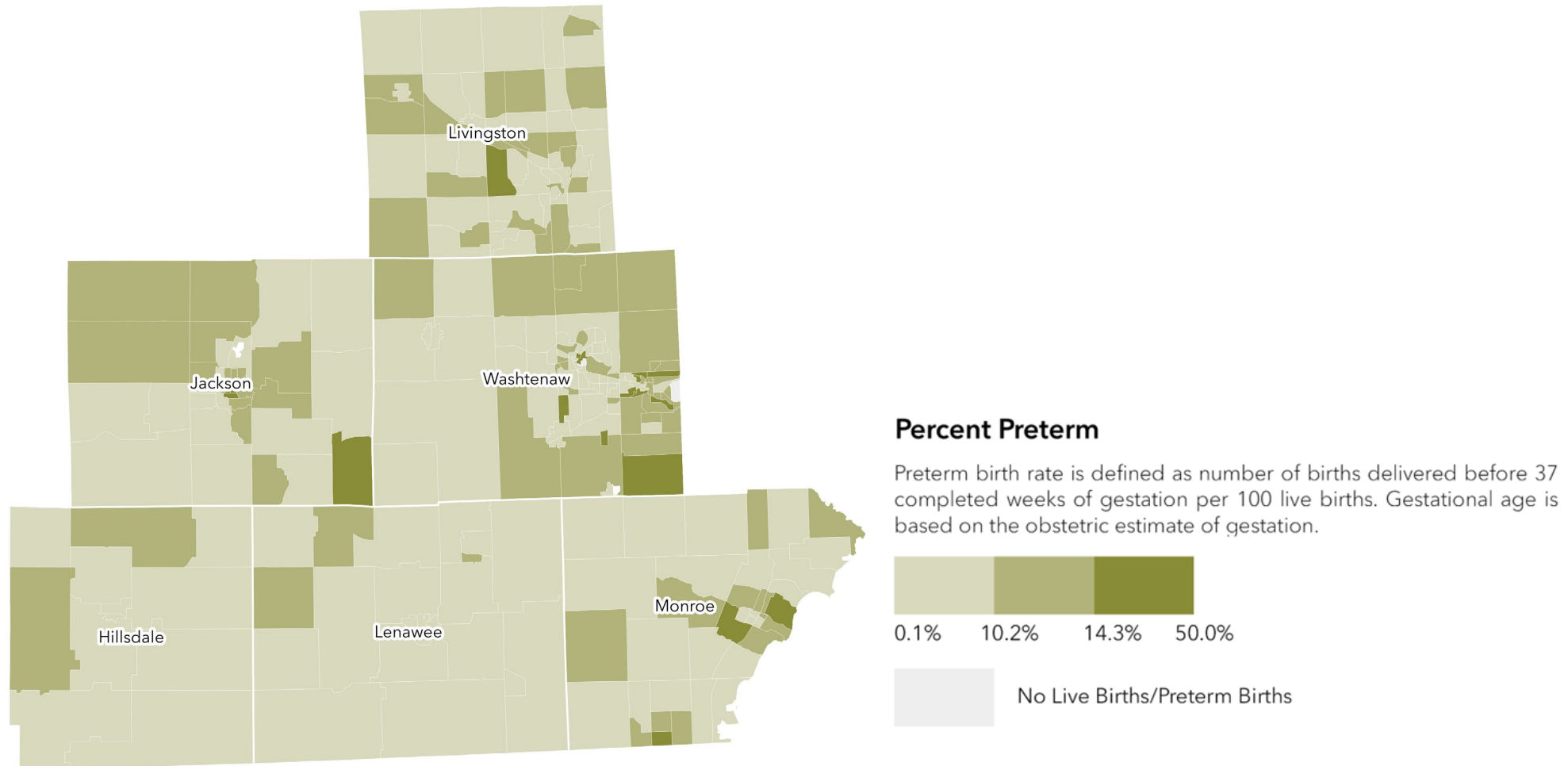
Preterm Birth by Intended Payment Source Prosperity Region 9, 2017-2021

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	2,991	32,705	9.1%	 9.1%	9.4%
Medicaid	1,722	15,131	11.4%	 11.4%	11.6%

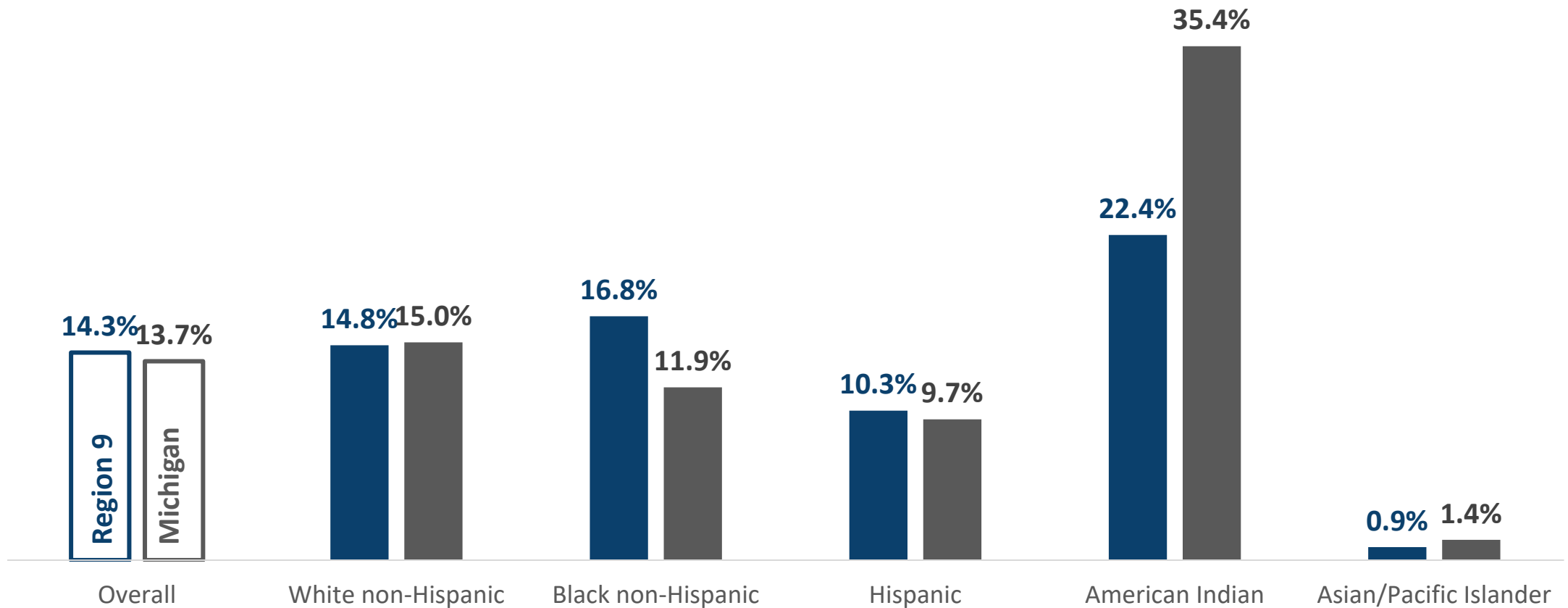
Preterm Birth by Census Tract Prosperity Region 9, 2016-2020

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 9
2017-2021**

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



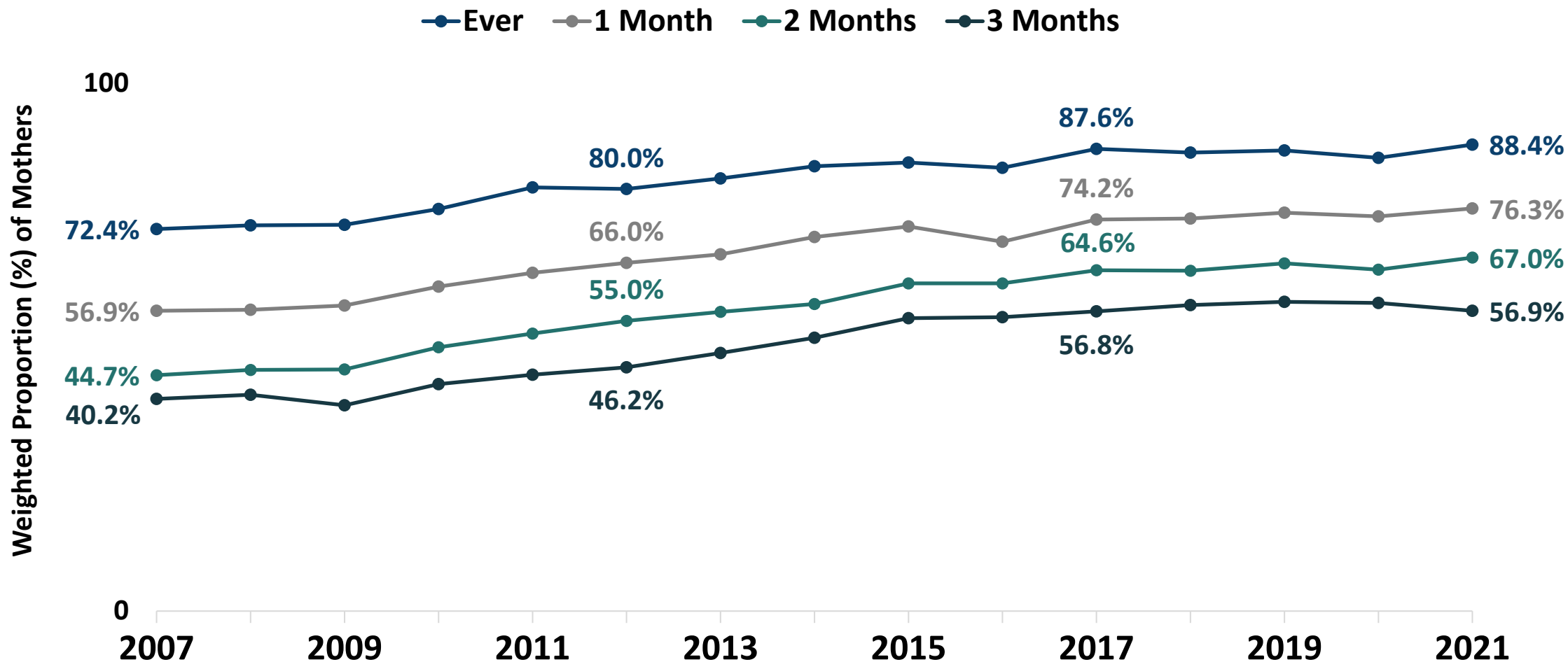
Smoking During Pregnancy by Race/Ethnicity Prosperity Region 9, 2017-2021

Comparison of methods used to measure cases among Native Americans	# Smoke during Pregnancy	# Live Births	Percent (%) Smoke during Pregnancy
#1: Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	19	85	22.4%
#2: Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	35	180	19.4%
#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)	58	322	18.0%

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

Breastfeeding Initiation + Duration Michigan, 2007-2021

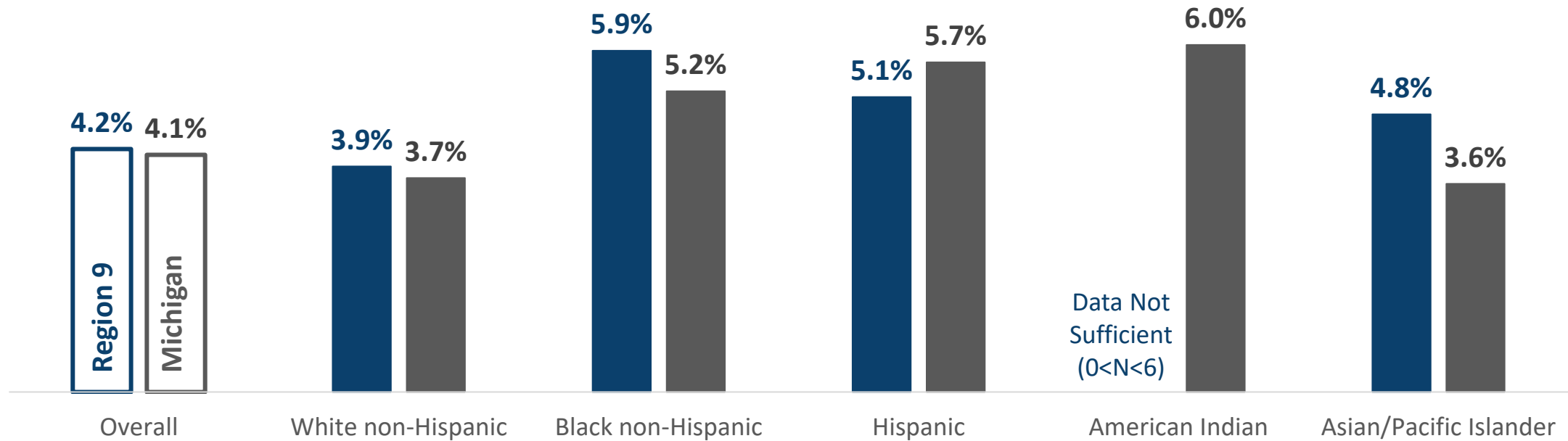
Significance test for all linear trends: $p < 0.0001$



**Late Entry into Prenatal Care
Prosperity Region 9
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 9, 2017-2021

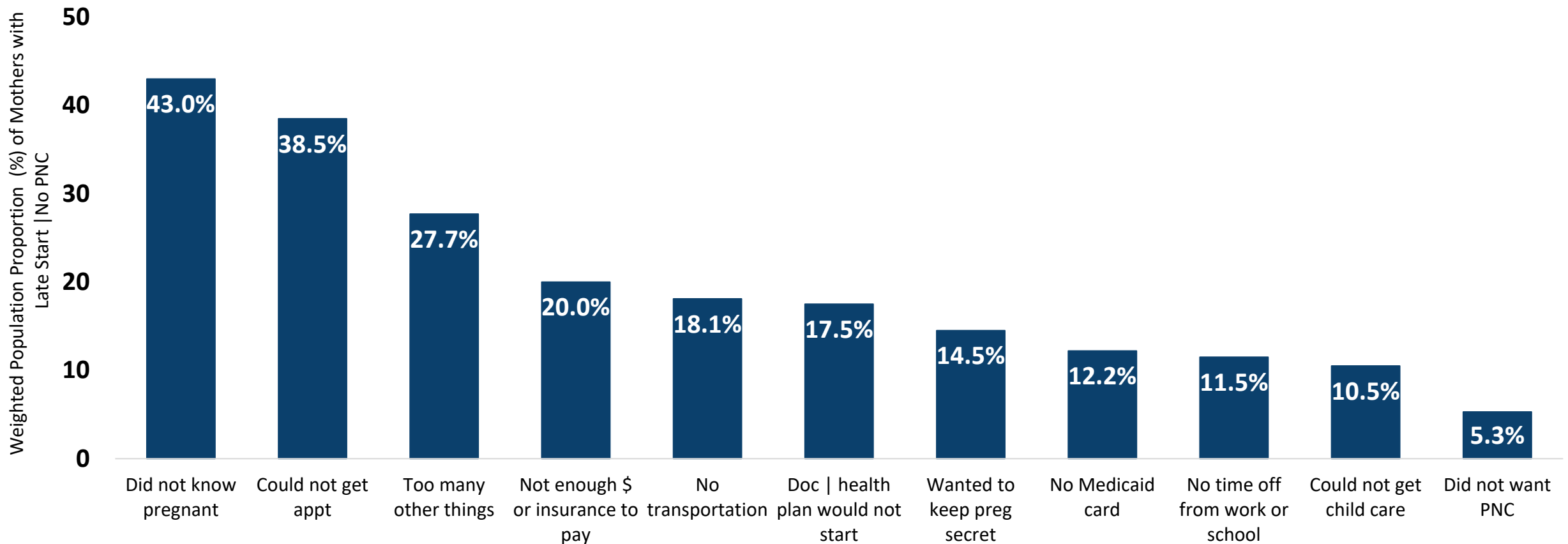
Late entry into prenatal care refers to begin prenatal care in the 7th – 9th month of gestation

Comparison of methods used to measure cases among Native Americans	# Late Prenatal Care	# Live Births	Percent (%) Late Prenatal Care
#1: Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	0<N<6	85	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).	9	180	5.0%
#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)	12	322	3.7%

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

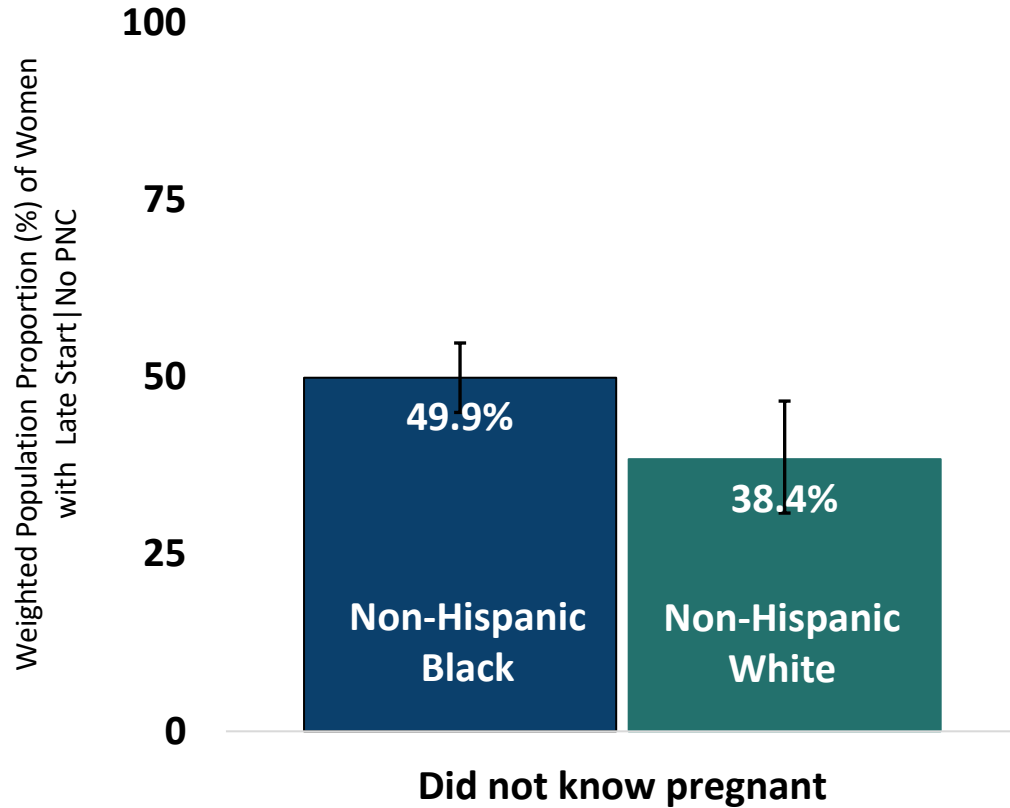
Barriers to Prenatal Care among Michigan Mothers who started PNC *after* 1st trimester and wanted to start sooner, 2016-2021

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

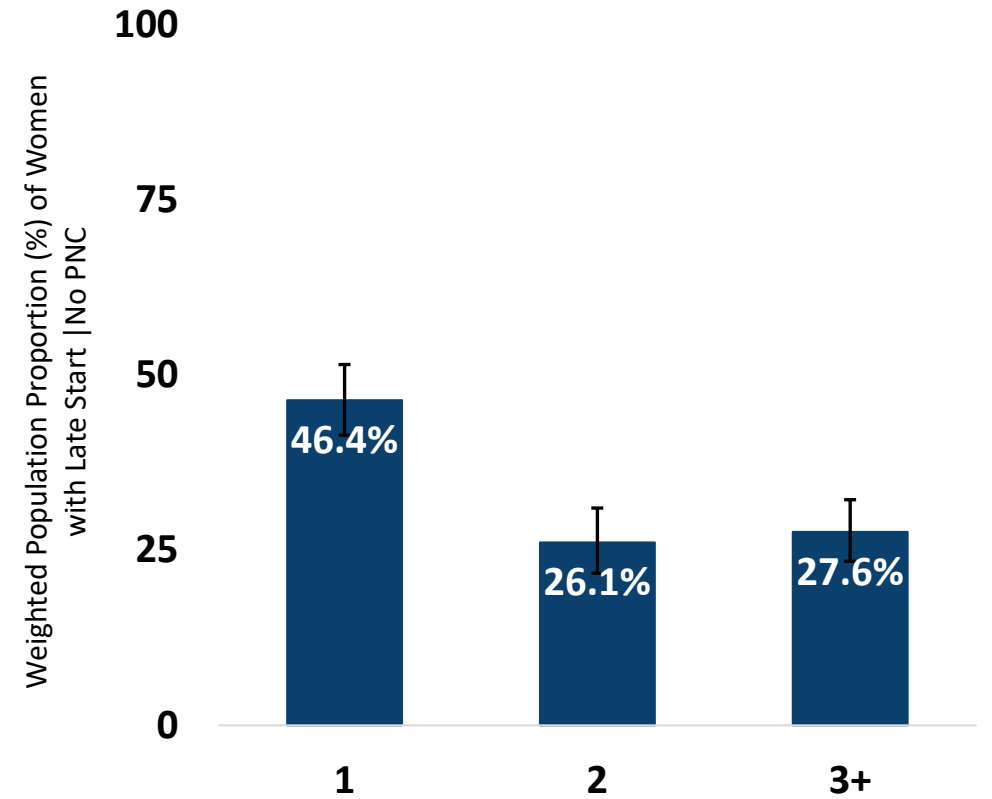


Barriers to Prenatal Care among Michigan Mothers who started PNC *after* 1st trimester and wanted to start sooner, 2016-2021

Selected Barriers with Significant Differences by Maternal Race/Ethnicity



Number of Barriers among Mothers with Late | No PNC



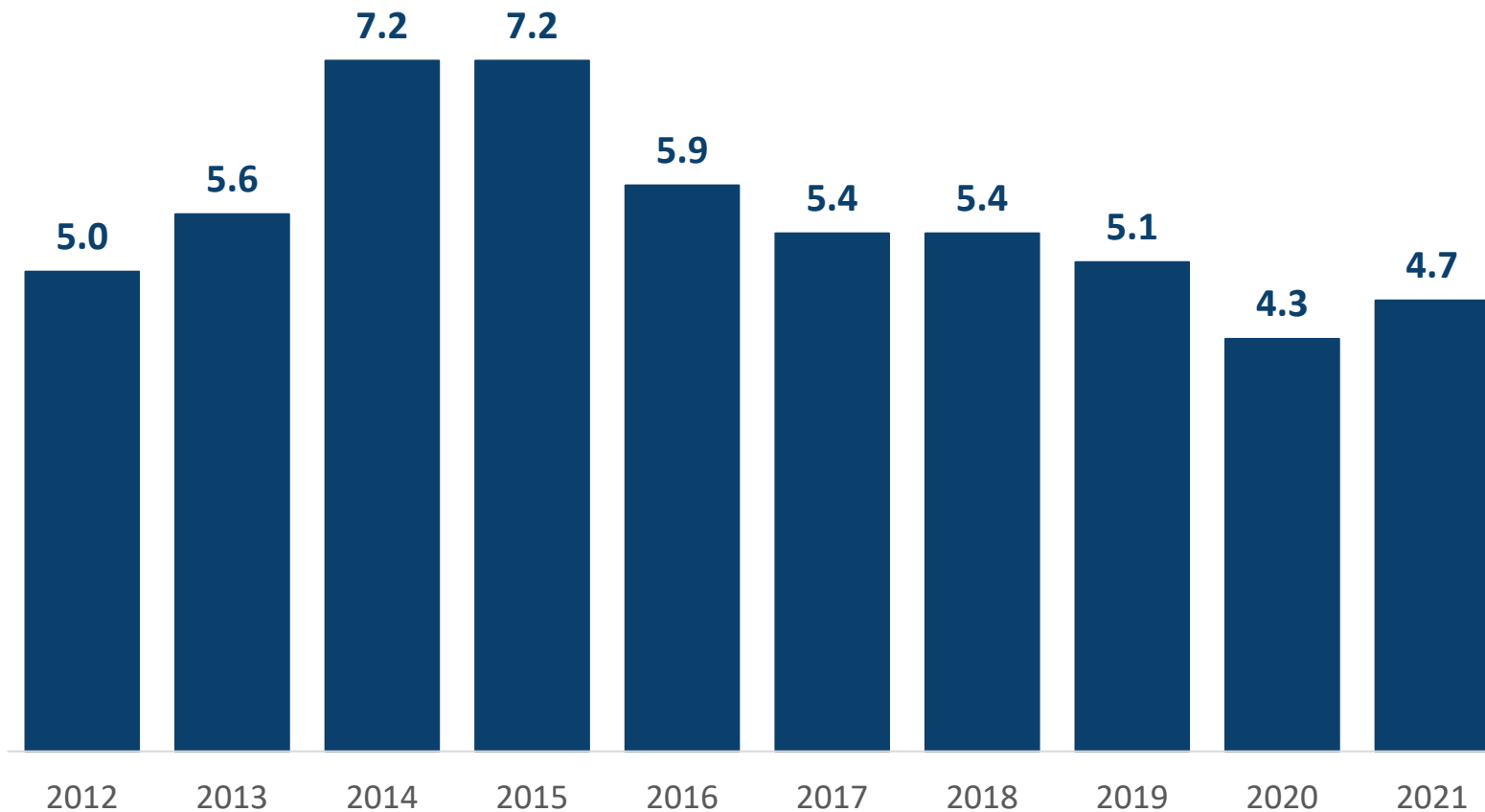
**Neonatal Abstinence Syndrome
Prosperity Region 9
2012-2021**

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 9, 2012-2021

Note: 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	51	10,297	5.0
2013	58	10,328	5.6
2014	76	10,571	7.2
2015	73	10,206	7.2
2016	62	10,471	5.9
2017	55	10,149	5.4
2018	54	10,035	5.4
2019	51	9,947	5.1
2020	42	9,660	4.3
2021	45	9,663	4.7

Neonatal Abstinence Syndrome by Maternal Race/Ethnicity Prosperity Region 9, 2017-2021

Note: 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	# NAS Cases	# Live Births	Neonatal Abstinence Syndrome Rate per 1,000 Live Births	MI
White non-Hispanic	220	39,447	5.6	8.1
Black non-Hispanic	7	3,877	1.8	3.6
Hispanic	7	2,396	2.9	5.2
American Indian	0<N<6	85	Data Not Sufficient	46.9
Asian/Pacific Islander	0	2,005	0	0.3

Neonatal Abstinence Syndrome by Race/Ethnicity Prosperity Region 9, 2017-2021

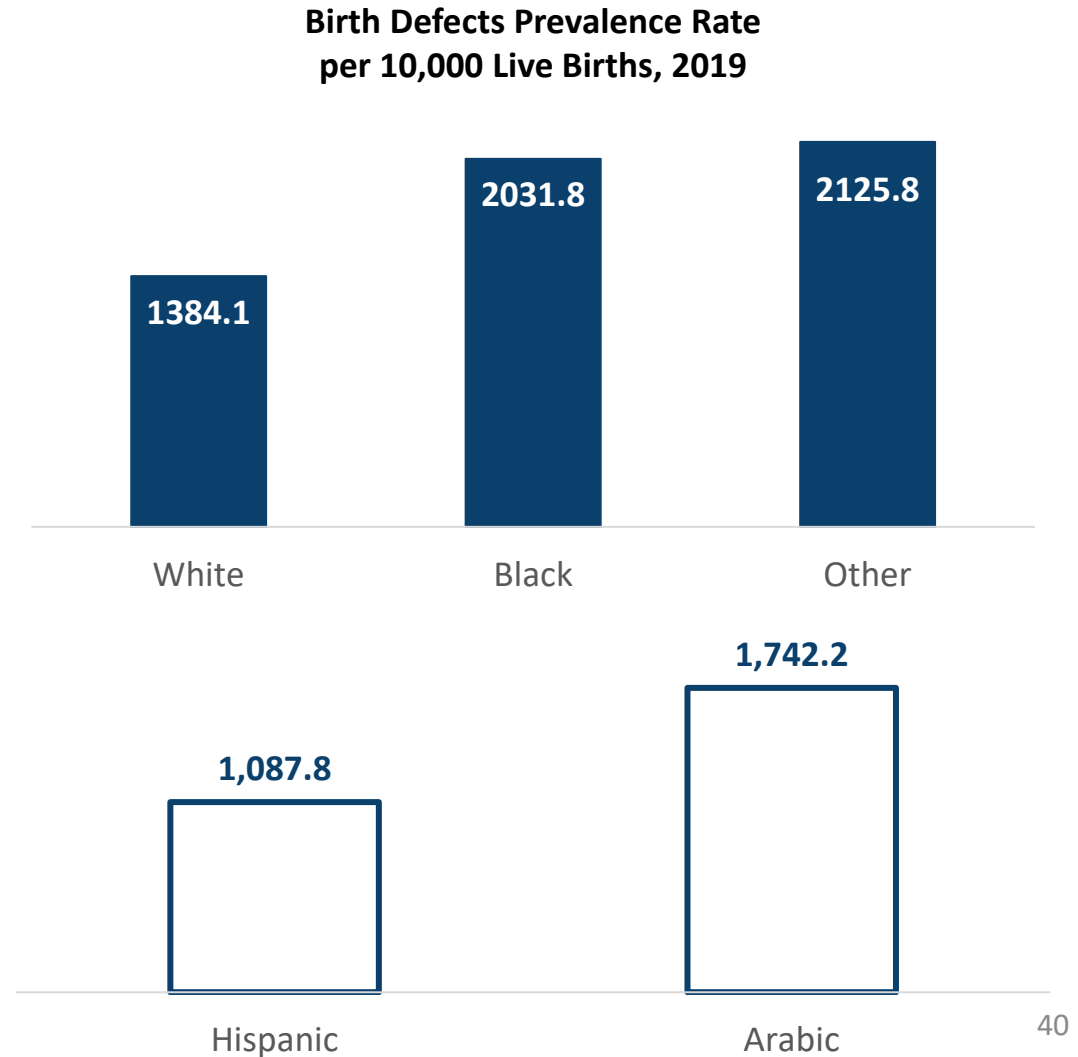
Note: 2010-2015: 779.5 (drug withdrawal syndrome in newborn) and 2016-current: P96.1 (neonatal withdrawal symptoms from maternal use of drugs of addiction)

Comparison of methods used to measure cases among Native Americans	# NAS Cases	# Live Births	NAS Rate per 1,000 Live Births
#1: Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	0<N<6	85	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).	0<N<6	180	Data Not Sufficient
#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)	0<N<6	322	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).

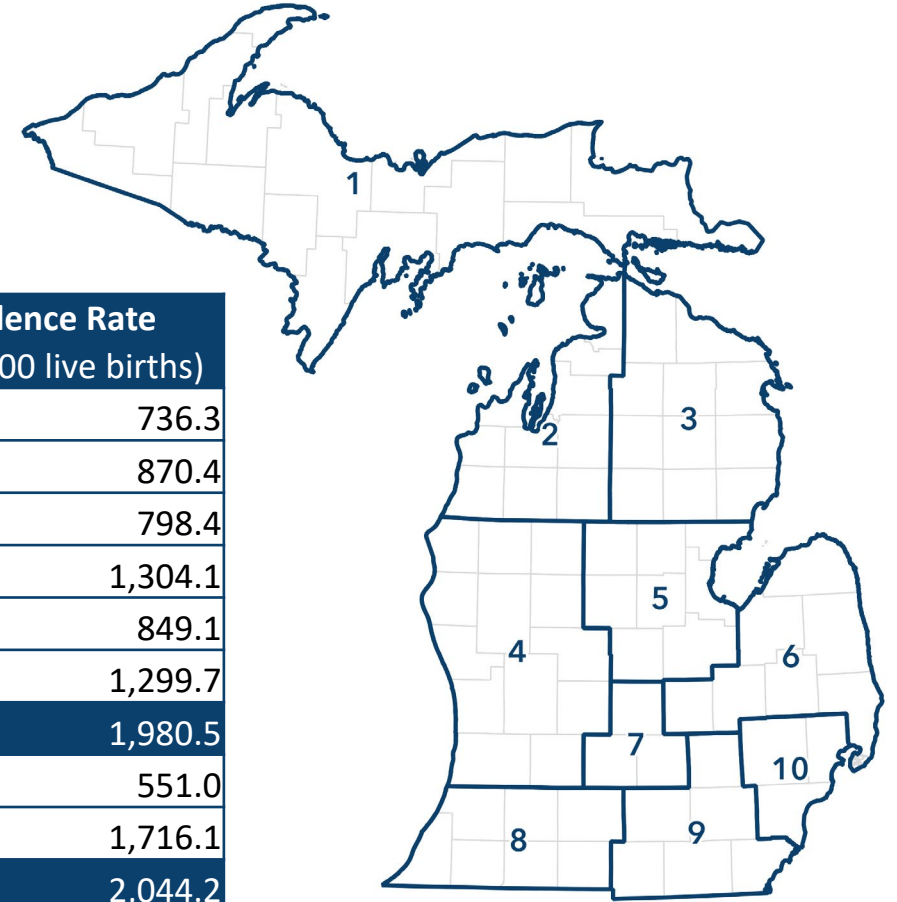


Birth Defect Prevalence Rates by Prosperity Region, 2019

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
Total	16,854	1,561.8



**Low Risk Cesarean
Prosperity Region 9
2017-2021**

Low Risk Cesarean by Maternal Race/Ethnicity Prosperity Region 9, 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 females with no prior birth had a cesarean
Overall	3,585	13,339	26.9%
White non-Hispanic	2,833	10,606	26.7%
Black non-Hispanic	247	856	28.9%
Hispanic	171	603	28.4%
American Indian	0<N<6	21	Data Not Sufficient
Asian/Pacific Islander	219	789	27.8%

Low Risk Cesarean by Race/Ethnicity Prosperity Region 9, 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 without a prior birth
#1: Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	0<N<6	21	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).	14	46	30.4%
#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)	23	80	28.8%

**Sleep-Related Infant Death Rate
Michigan
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

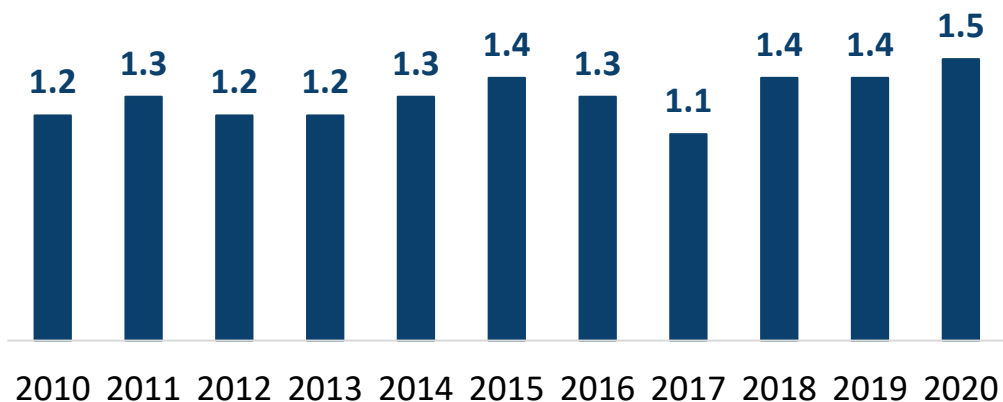
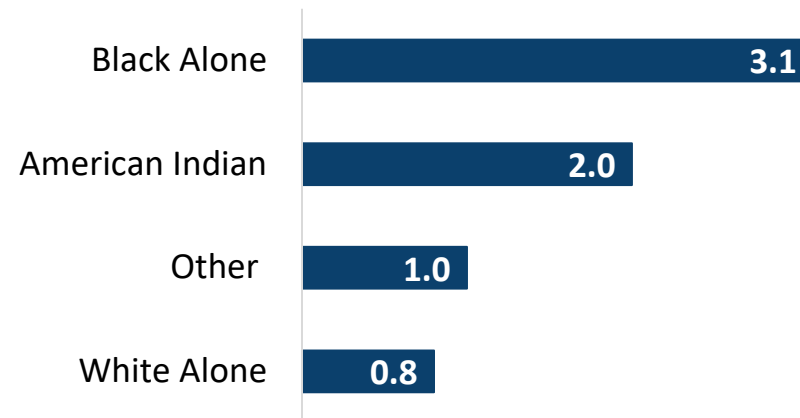


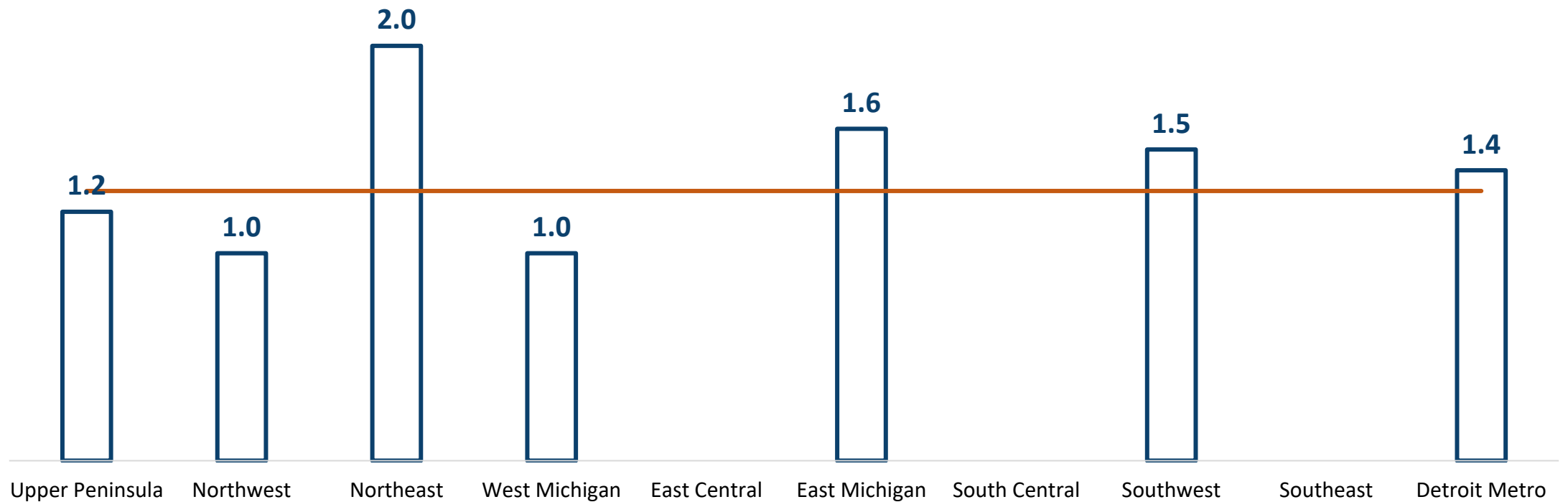
Figure 2. Rate of Sleep-Related Infant Deaths
per 1,000 Live Births



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
2010-2020
Michigan: 1.3

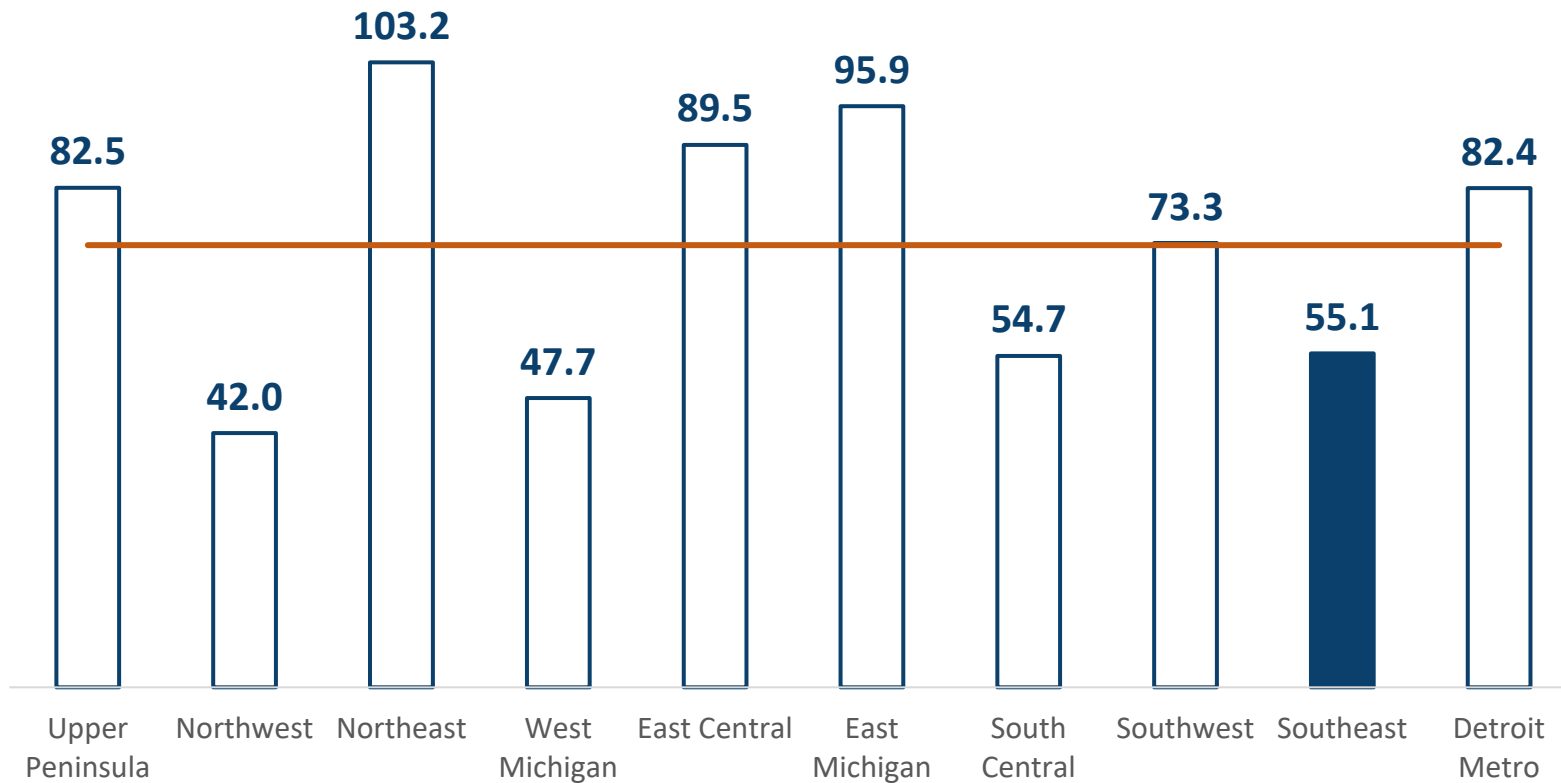


**Maternal Mortality Ratio
Prosperity Region 9
2015-2019**

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 Nine there were **28** maternal deaths between 2015 and 2019.