



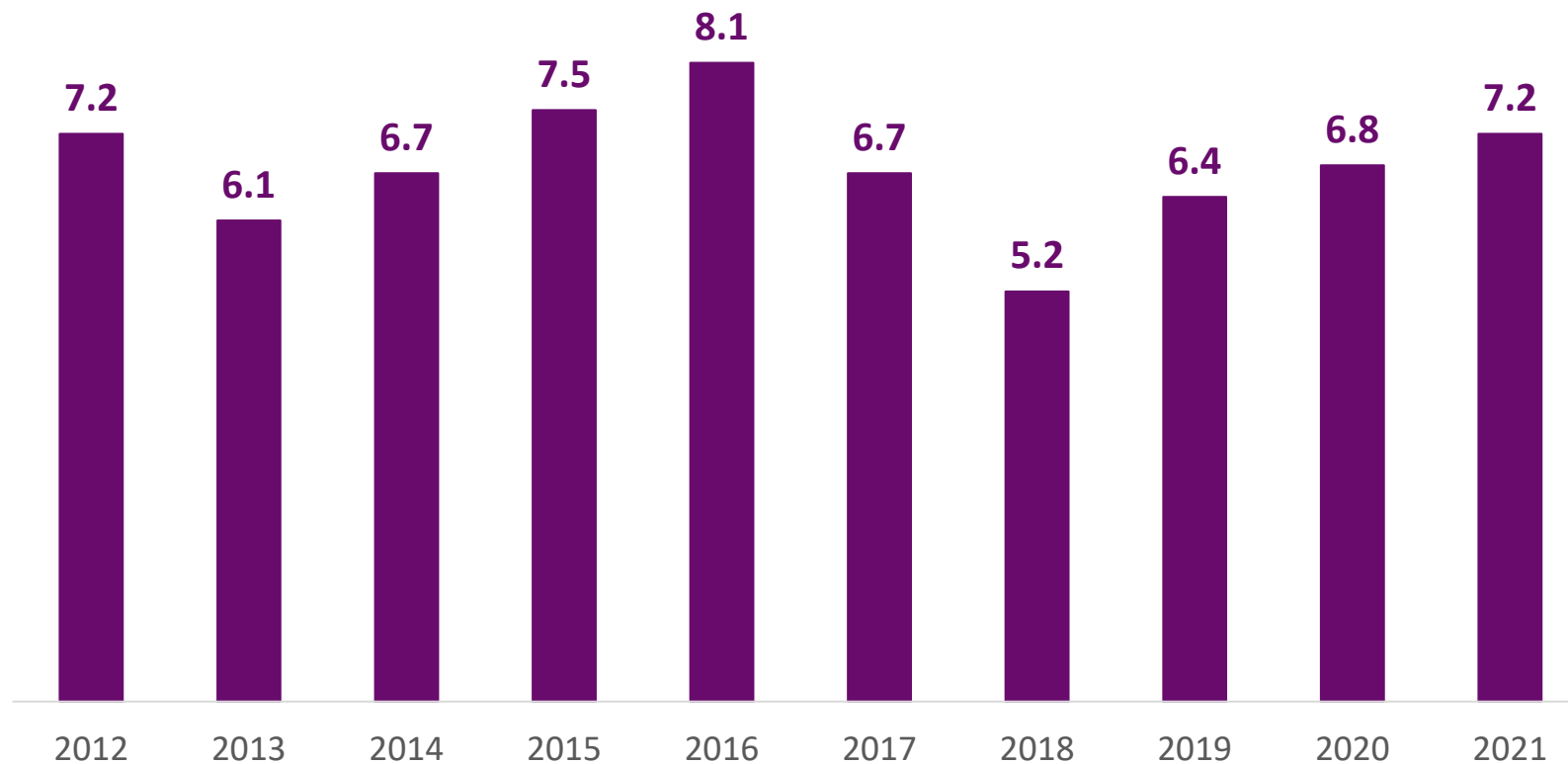
Maternal and Infant Health Statistics Prosperity Region 6 Michigan

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 6 2012-2021

Infant Mortality Rate Prosperity Region 6, 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	67	9,306	7.2
2013	57	9,366	6.1
2014	63	9,424	6.7
2015	68	9,067	7.5
2016	75	9,214	8.1
2017	60	8,938	6.7
2018	46	8,792	5.2
2019	56	8,810	6.4
2020	57	8,433	6.8
2021	61	8,527	7.2

Infant Mortality Rates by Maternal Race/Ethnicity Prosperity Region 6, 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	174	33,862	5.1	 5.1	4.8
Black Non-Hispanic	79	6,608	12.0	 12.0	13.6
Hispanic	19	1,821	10.4	 10.4	5.6
American Indian	0	65	0		5.5
Asian/Pacific Islander	0<N<6	324	Data Not Sufficient		4.5

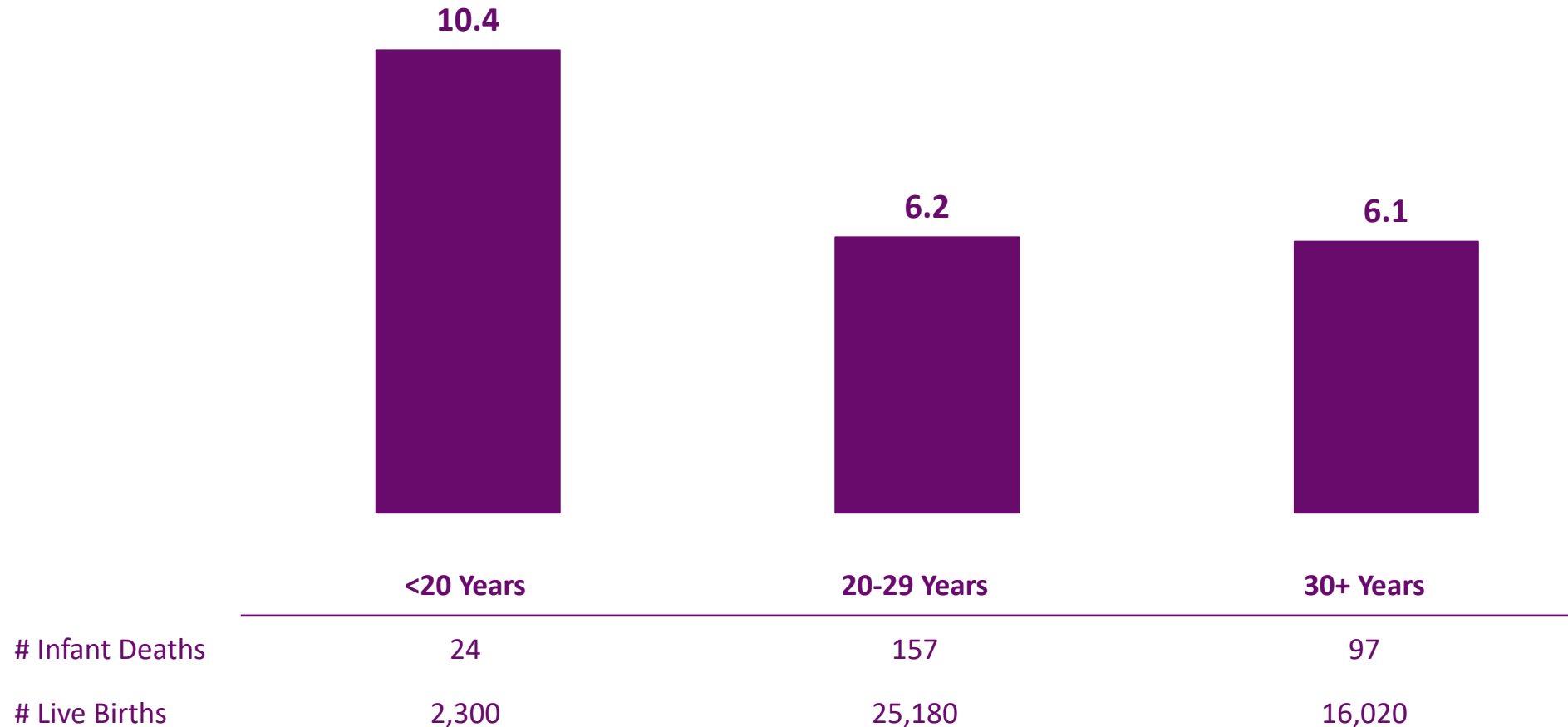
Birth Outcomes by Race/Ethnicity Prosperity Region 6, 2017-2021

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	65	0	7	0<N<6	0.0	10.8%	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).	183	0<N<6	17	14	Data Not Sufficient	9.3%	7.7%
#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)	310	0<N<6	26	25	Data Not Sufficient	8.4%	8.1%



Infant Mortality Rate by Maternal Age Prosperity Region 6, 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.



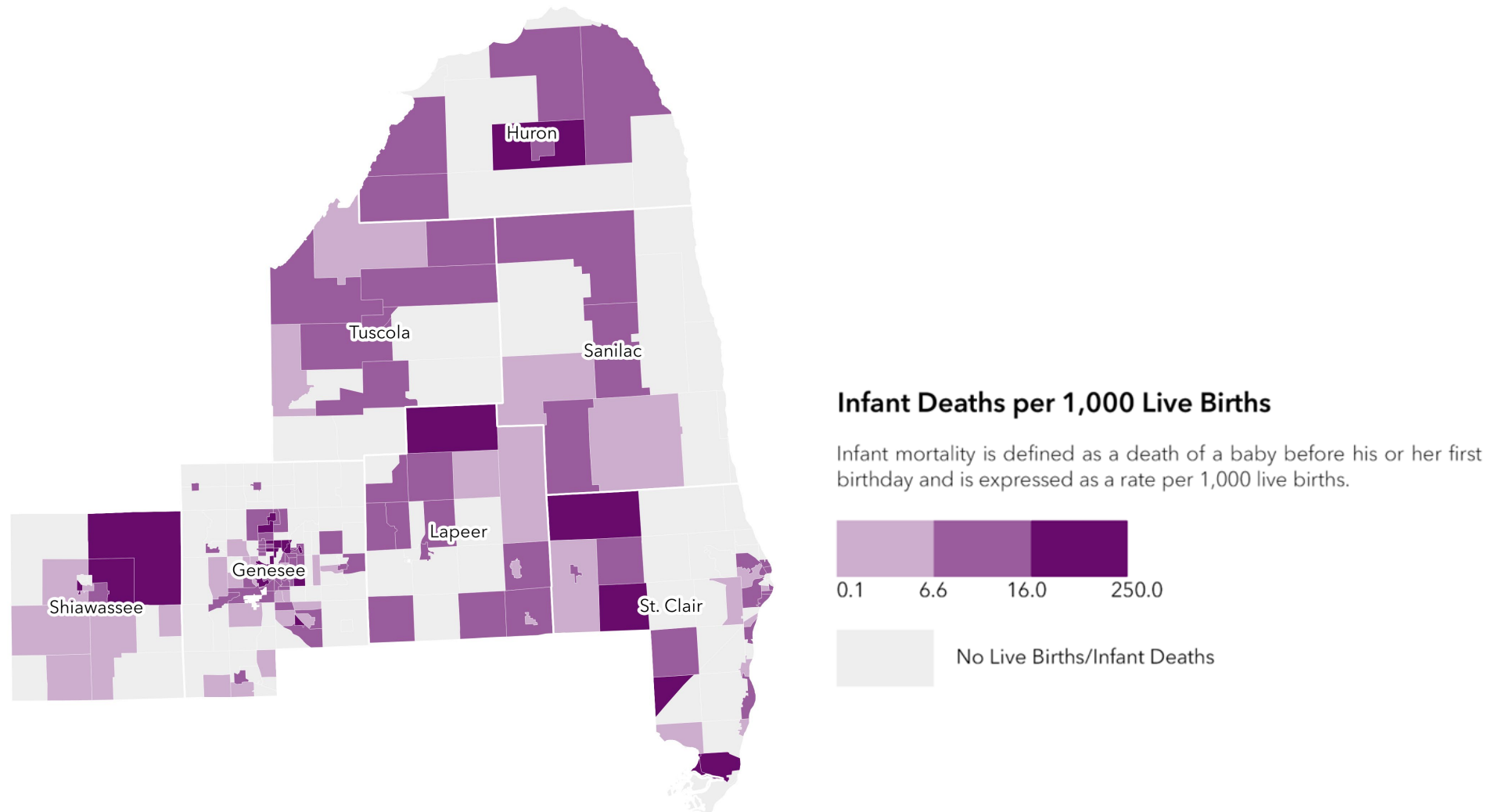
Infant Mortality Rates by Intended Payment Source Prosperity Region 6, 2017-2021

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	87	21,294	4.1	 4.1	4.9
Medicaid	181	21,145	8.6	 8.6	8.7

Infant Mortality Rates by Census Tract Prosperity Region 6, 2016-2020

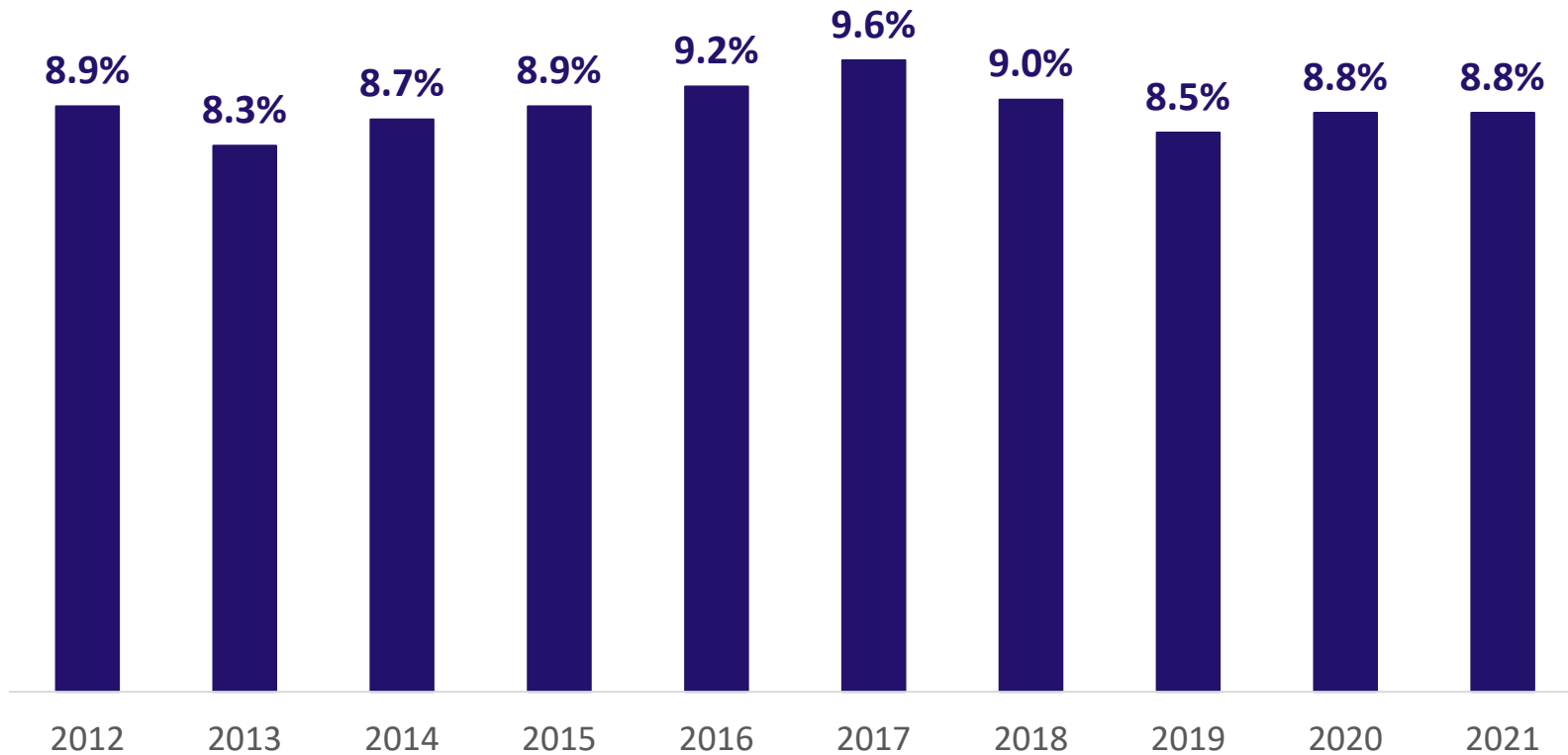
Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.



Low Birthweight (LBW) Prosperity Region 6 2012-2021

Low Birthweight Prosperity Region 6, 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	831	9,306	8.9%
2013	778	9,366	8.3%
2014	818	9,424	8.7%
2015	810	9,067	8.9%
2016	849	9,214	9.2%
2017	862	8,938	9.6%
2018	791	8,792	9.0%
2019	747	8,810	8.5%
2020	741	8,433	8.8%
2021	751	8,527	8.8%

Low Birthweight by Maternal Race/Ethnicity Prosperity Region 6, 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	2,629	33,862	7.8%	 7.8%	7.2%
Black non-Hispanic	1,013	6,608	15.3%	 15.3%	15.2%
Hispanic	135	1,821	7.4%	 7.4%	7.7%
American Indian	7	65	10.8%	 10.8%	8.4%
Asian/Pacific Islander	25	324	7.7%	 7.7%	9.0%

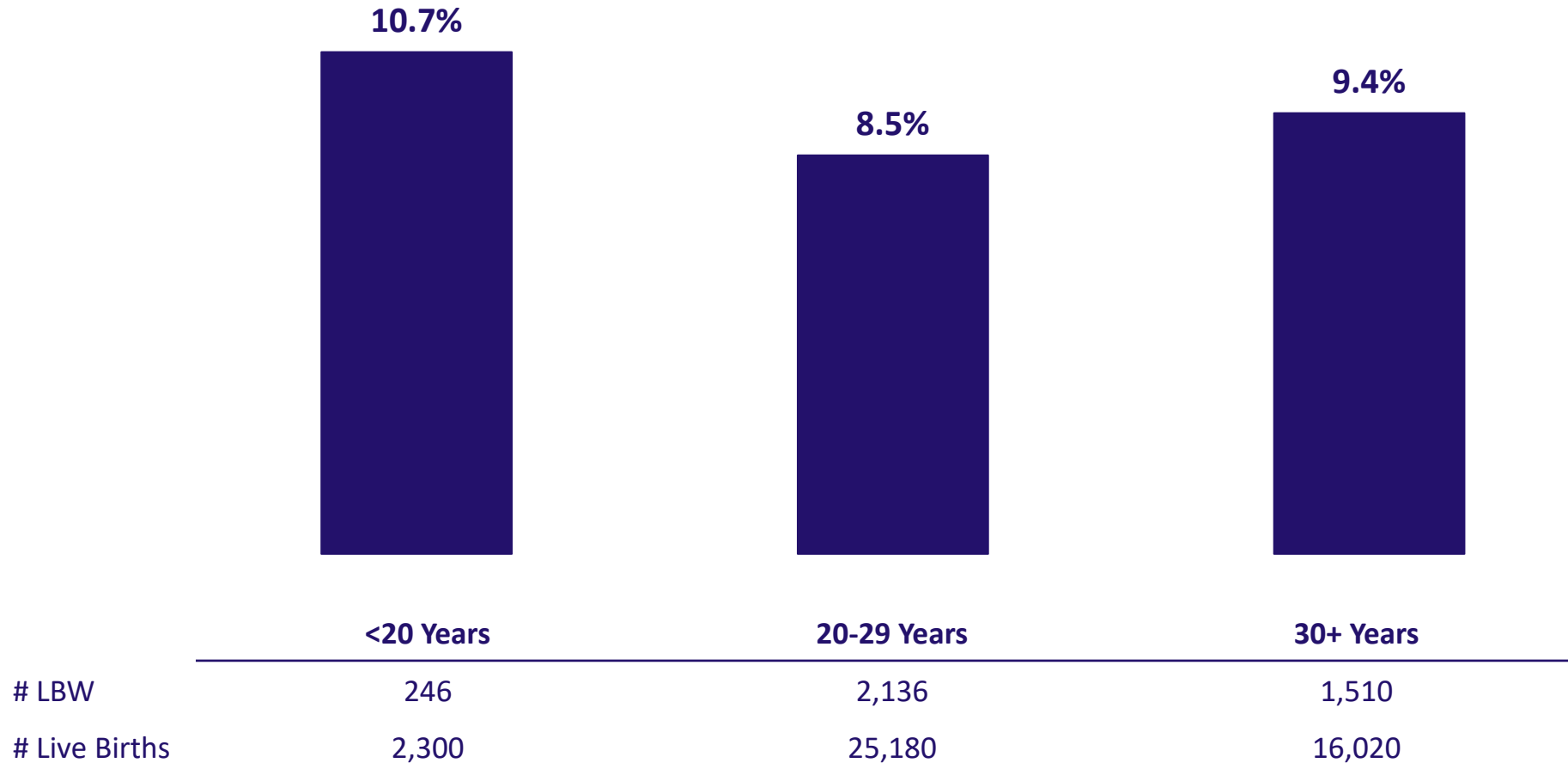
Birth Outcomes by Race/Ethnicity Prosperity Region 6, 2017-2021

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	65	0	7	0<N<6	0.0	10.8%	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).	183	0<N<6	17	14	Data Not Sufficient	9.3%	7.7%
#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)	310	0<N<6	26	25	Data Not Sufficient	8.4%	8.1%



Low Birthweight by Maternal Age Prosperity Region 6, 2017-2021

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



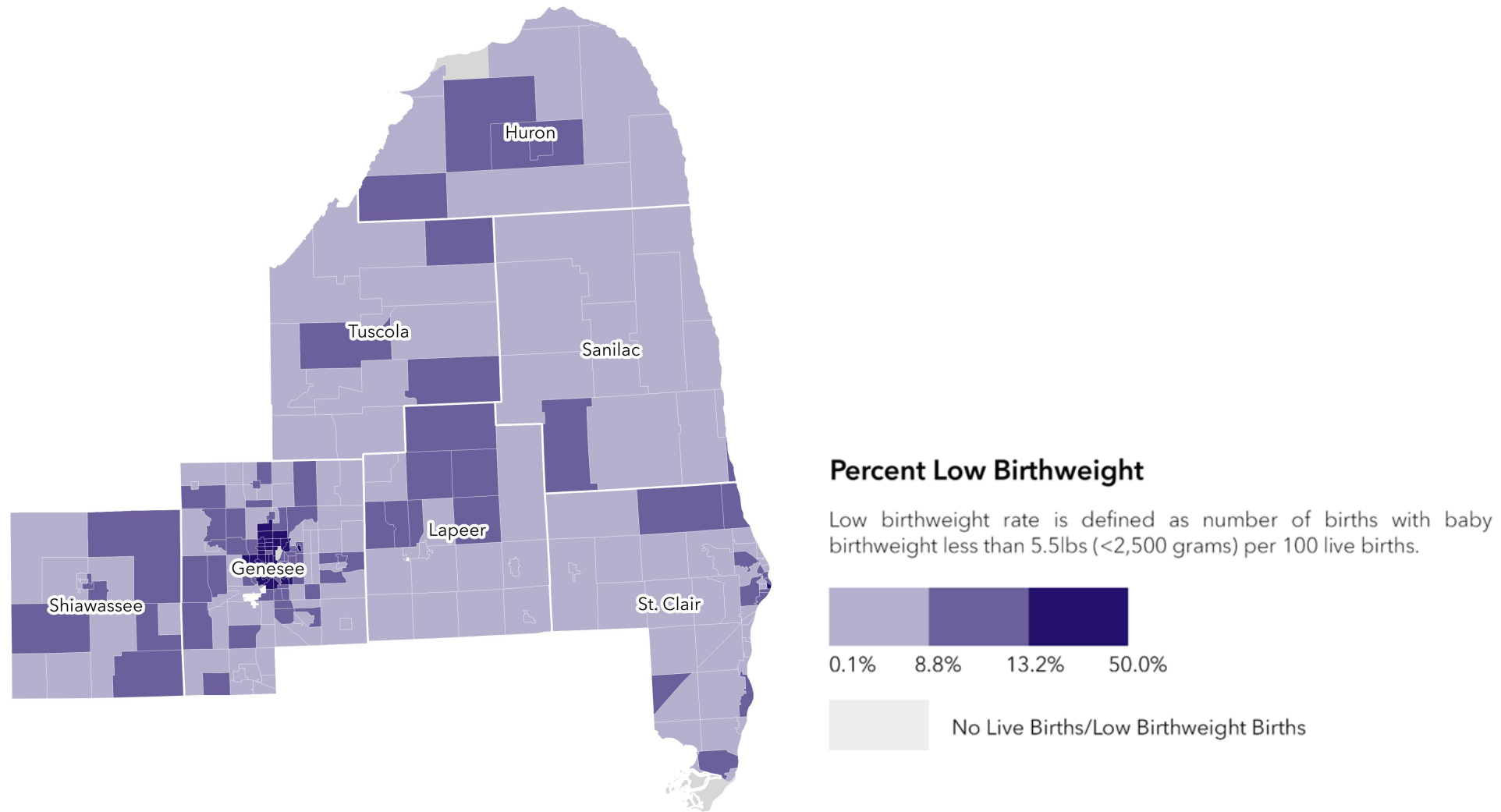
Low Birthweight by Intended Payment Source Prosperity Region 6, 2017-2021

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	1,457	21,294	6.8%	 6.8%	7.5%
Medicaid	2,355	21,145	11.1%	 11.1%	10.9%

Low Birthweight by Census Tract Prosperity Region 6, 2016-2020

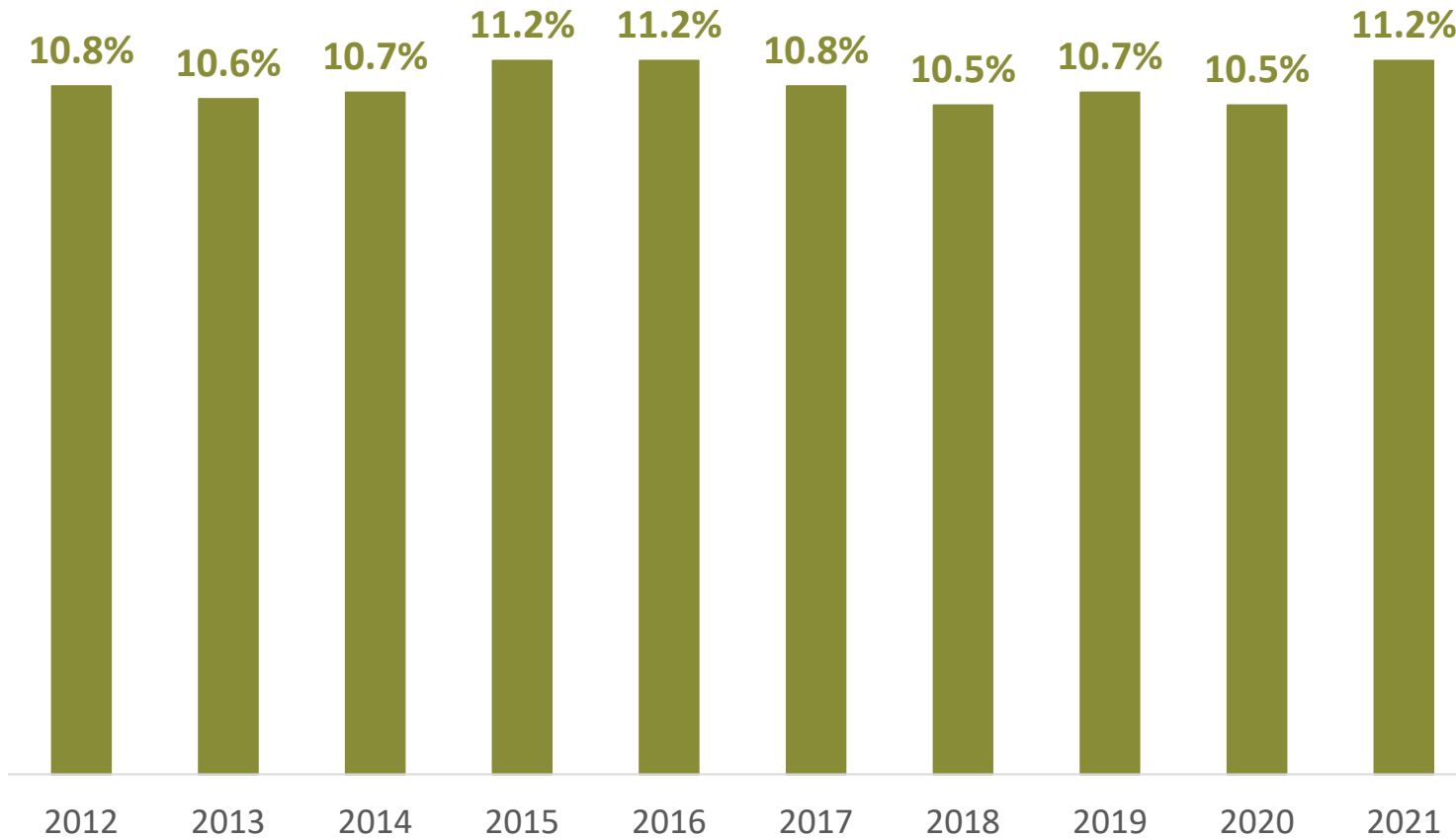
Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.



Preterm Birth Prosperity Region 6 2012-2021

Preterm Birth Prosperity Region 6, 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	1,009	9,306	10.8%
2013	989	9,366	10.6%
2014	1,004	9,424	10.7%
2015	1,013	9,067	11.2%
2016	1,032	9,214	11.2%
2017	965	8,938	10.8%
2018	925	8,792	10.5%
2019	940	8,810	10.7%
2020	888	8,433	10.5%
2021	954	8,527	11.2%

Preterm Birth by Maternal Race/Ethnicity Prosperity Region 6, 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	3,364	33,862	9.9%	 9.9%	9.2%
Black non-Hispanic	987	6,608	14.9%	 14.9%	14.9%
Hispanic	201	1,821	11.0%	 11.0%	9.8%
American Indian	0<N<6	65	Data Not Sufficient		10.1%
Asian/Pacific Islander	30	324	9.3%	 9.3%	8.2%

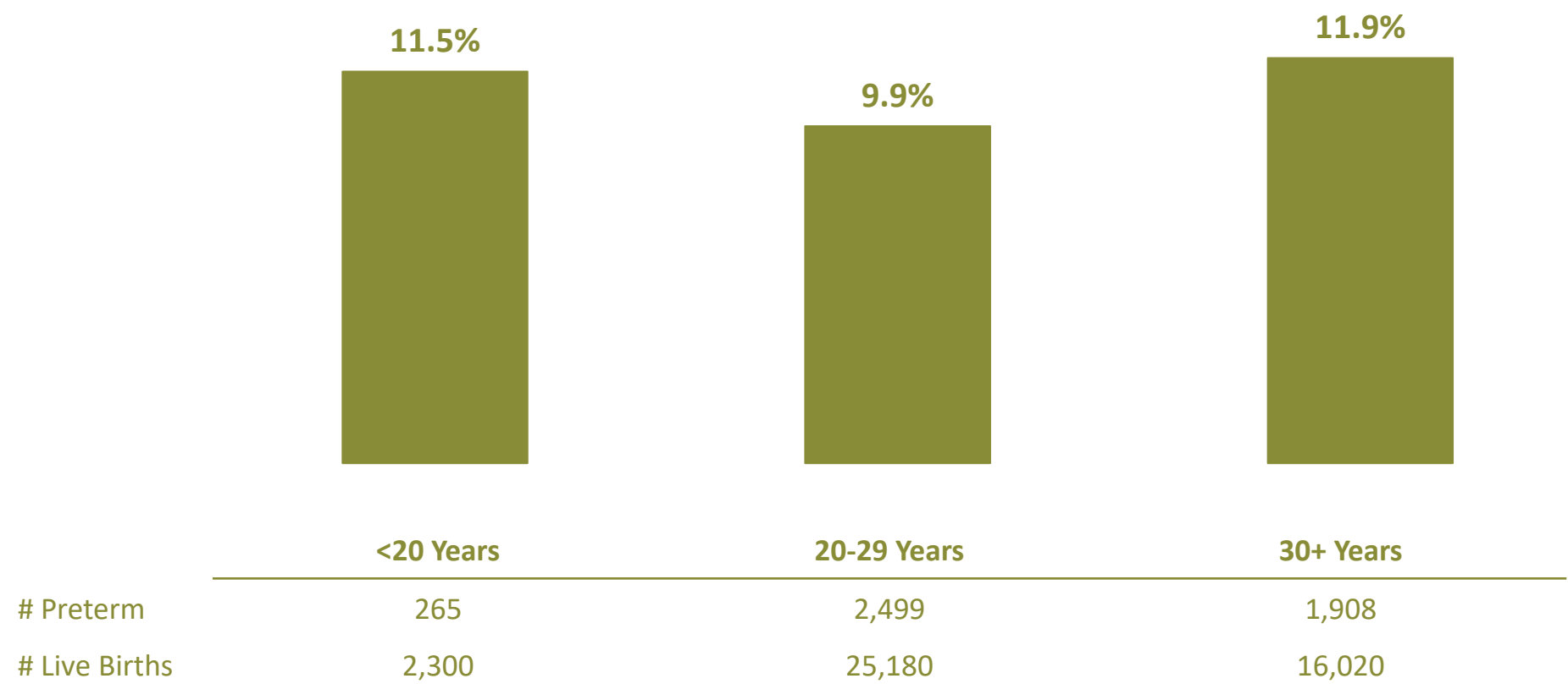
Birth Outcomes by Race/Ethnicity Prosperity Region 6, 2017-2021

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	65	0	7	0<N<6	0.0	10.8%	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).	183	0<N<6	17	14	Data Not Sufficient	9.3%	7.7%
#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)	310	0<N<6	26	25	Data Not Sufficient	8.4%	8.1%



Preterm Birth by Maternal Age Prosperity Region 6, 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.



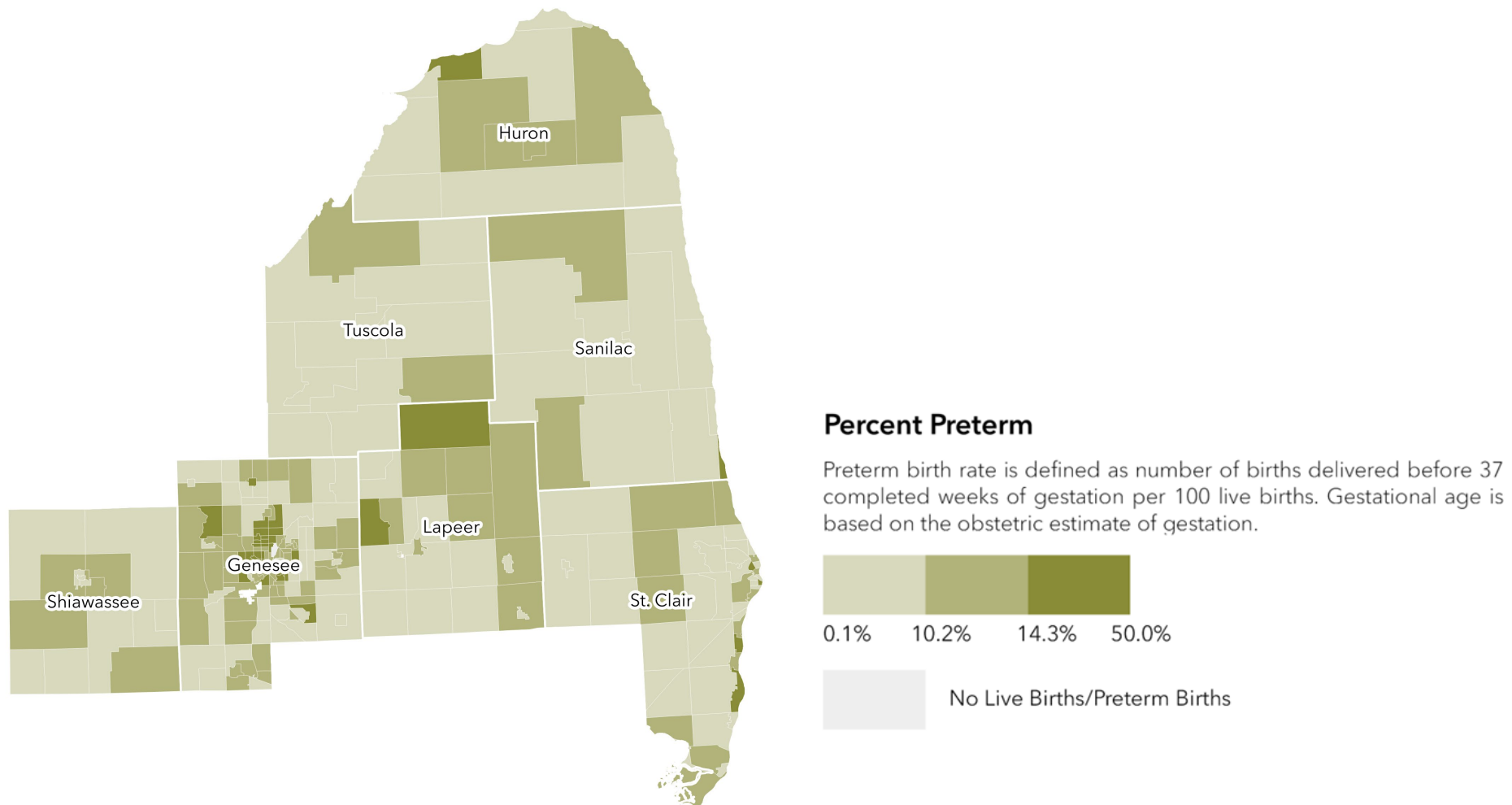
Preterm Birth by Intended Payment Source Prosperity Region 6, 2017-2021

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	2,003	21,294	9.4%	 9.4%	9.4%
Medicaid	2,566	21,145	12.1%	 12.1%	11.6%

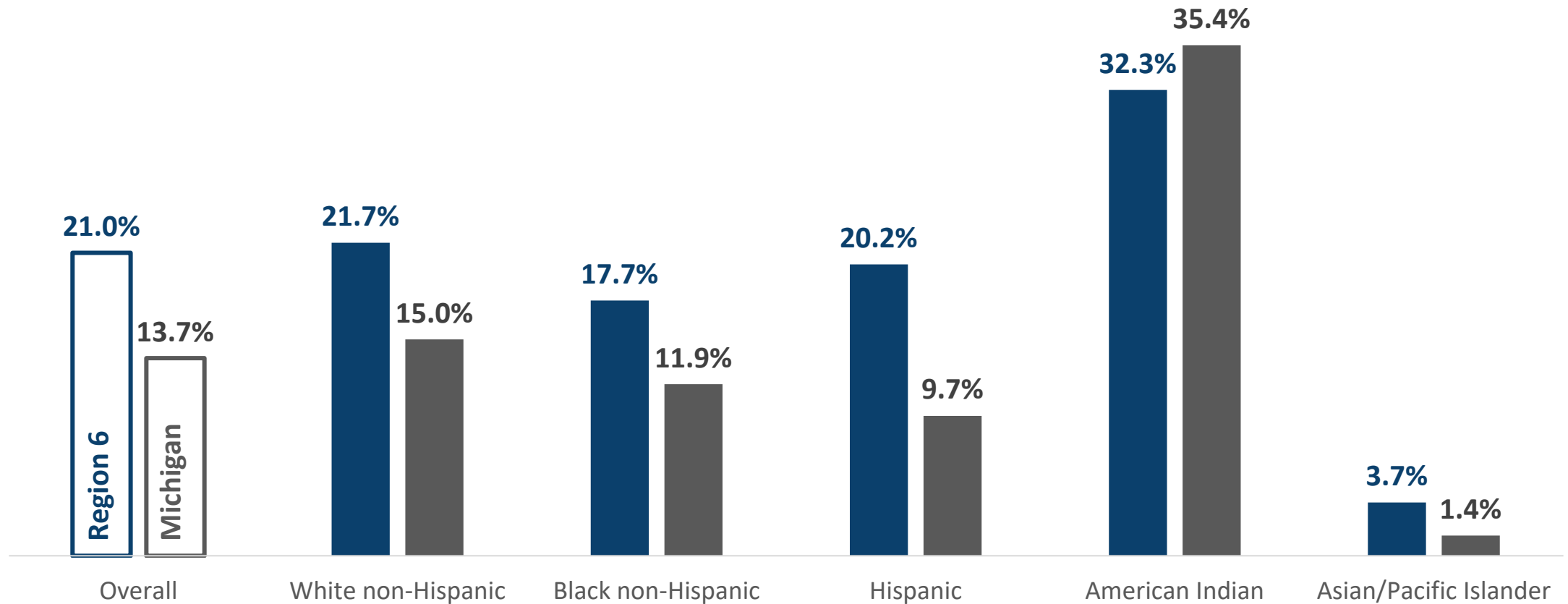
Preterm Birth by Census Tract Prosperity Region 6, 2016-2020

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 6 2017-2021

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



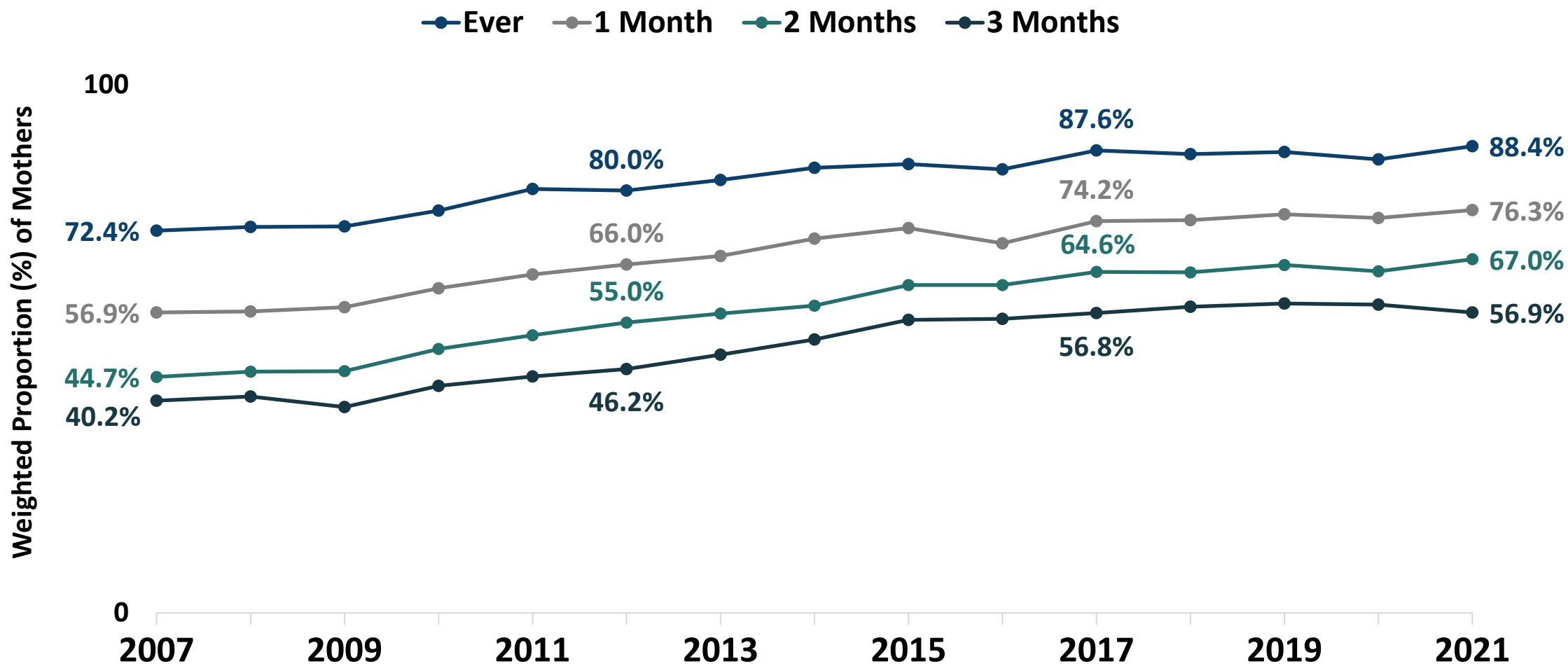
Smoking During Pregnancy by Race/Ethnicity Prosperity Region 6, 2017-2021

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	21	65	32.3%
#2: Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native).	60	183	32.8%
#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)	95	310	30.6%

Breastfeeding Initiation and Duration Michigan 2007-2021

Breastfeeding Initiation + Duration Michigan, 2007-2021

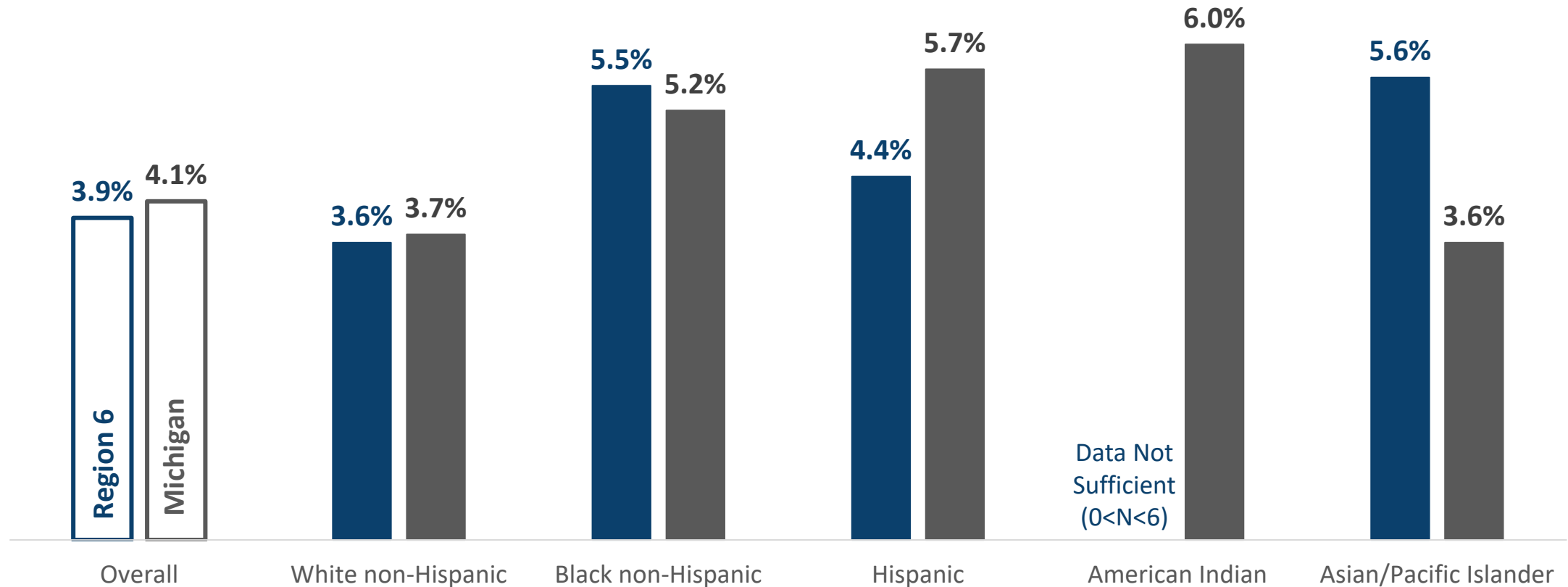
Significance test for all linear trends: $p < 0.0001$



Late Entry into Prenatal Care Prosperity Region 6 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 6, 2017-2021

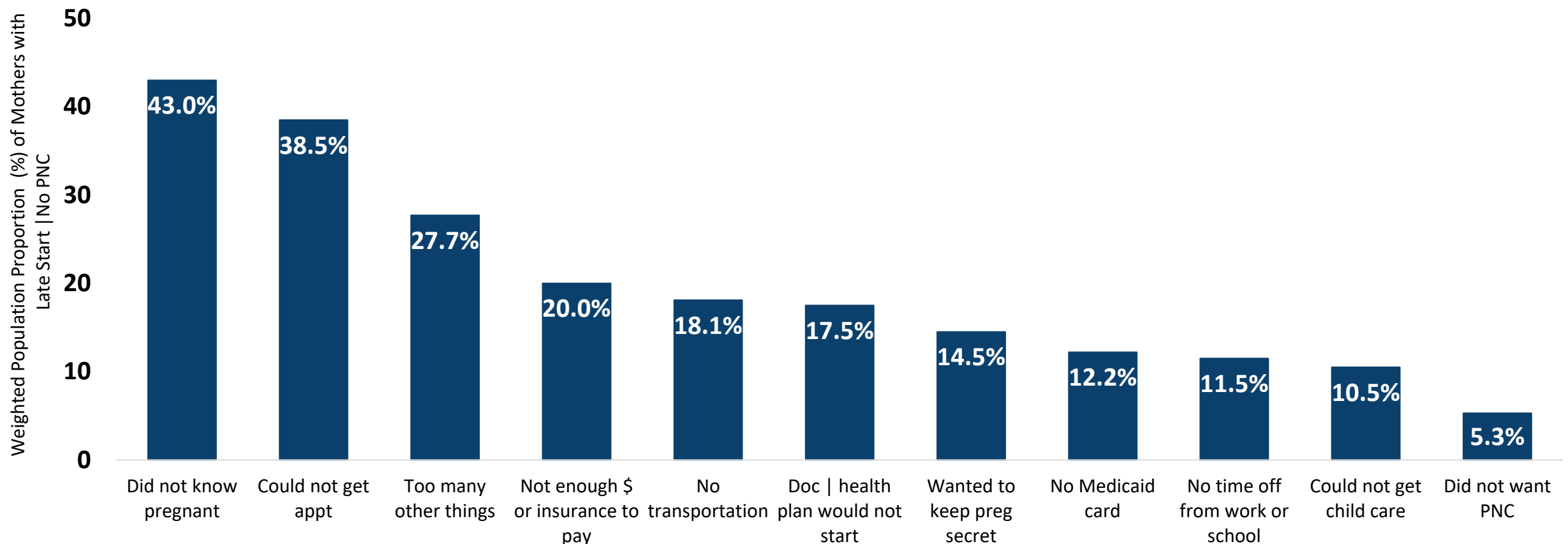
Late entry into prenatal care refers to begin prenatal care in the 7th – 9th month of gestation

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	65	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).	7	183	3.8%
#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	310	3.9%

Barriers to Prenatal Care Michigan 2016-2021

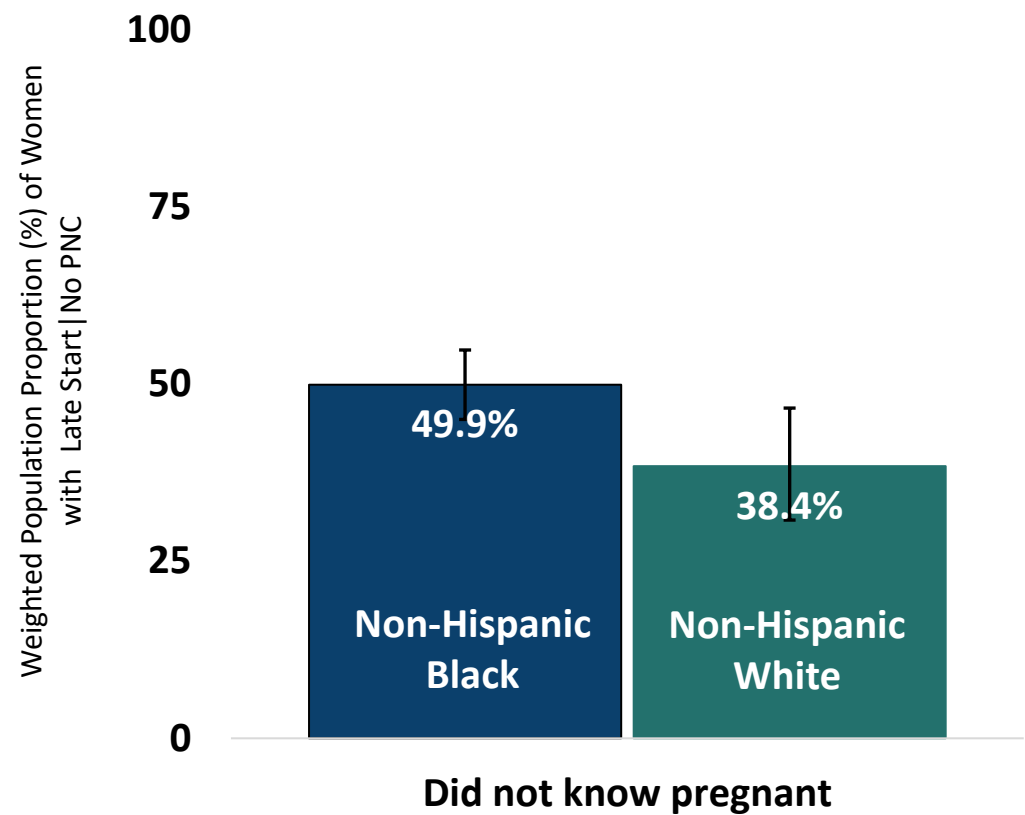
Barriers to Prenatal Care among Michigan Mothers who started PNC *after* 1st trimester and wanted to start sooner, 2016-2021

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

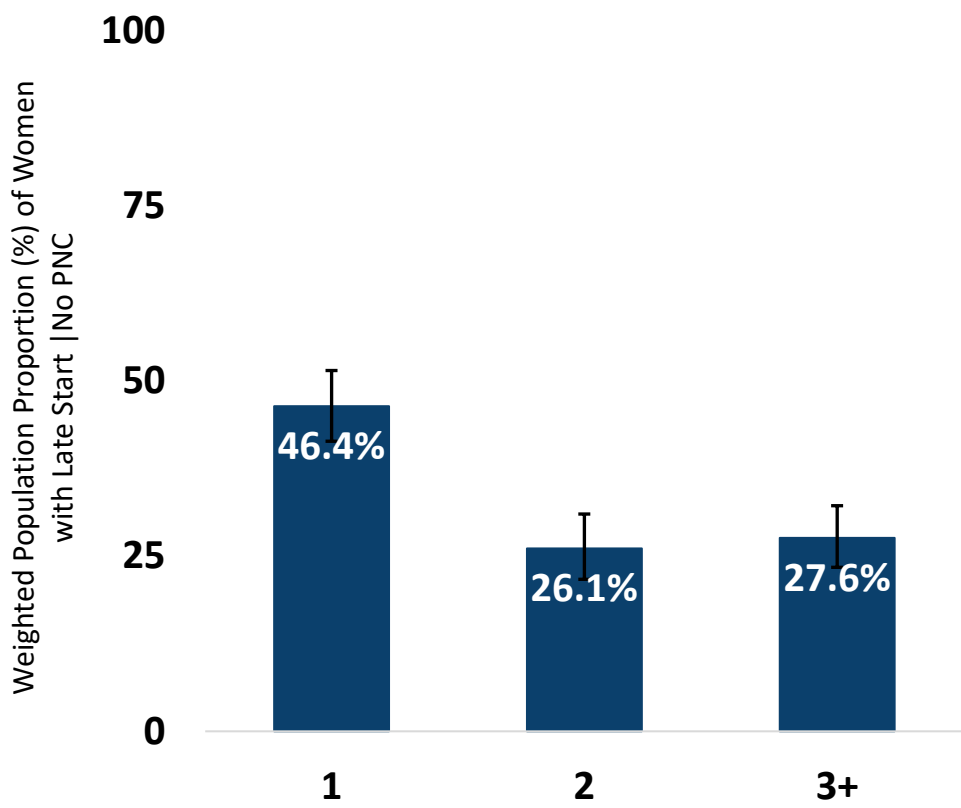


Barriers to Prenatal Care among Michigan Mothers who started PNC *after* 1st trimester and wanted to start sooner, 2016-2021

Selected Barriers with Significant Differences by Maternal Race/Ethnicity



Number of Barriers among Mothers with Late | No PNC



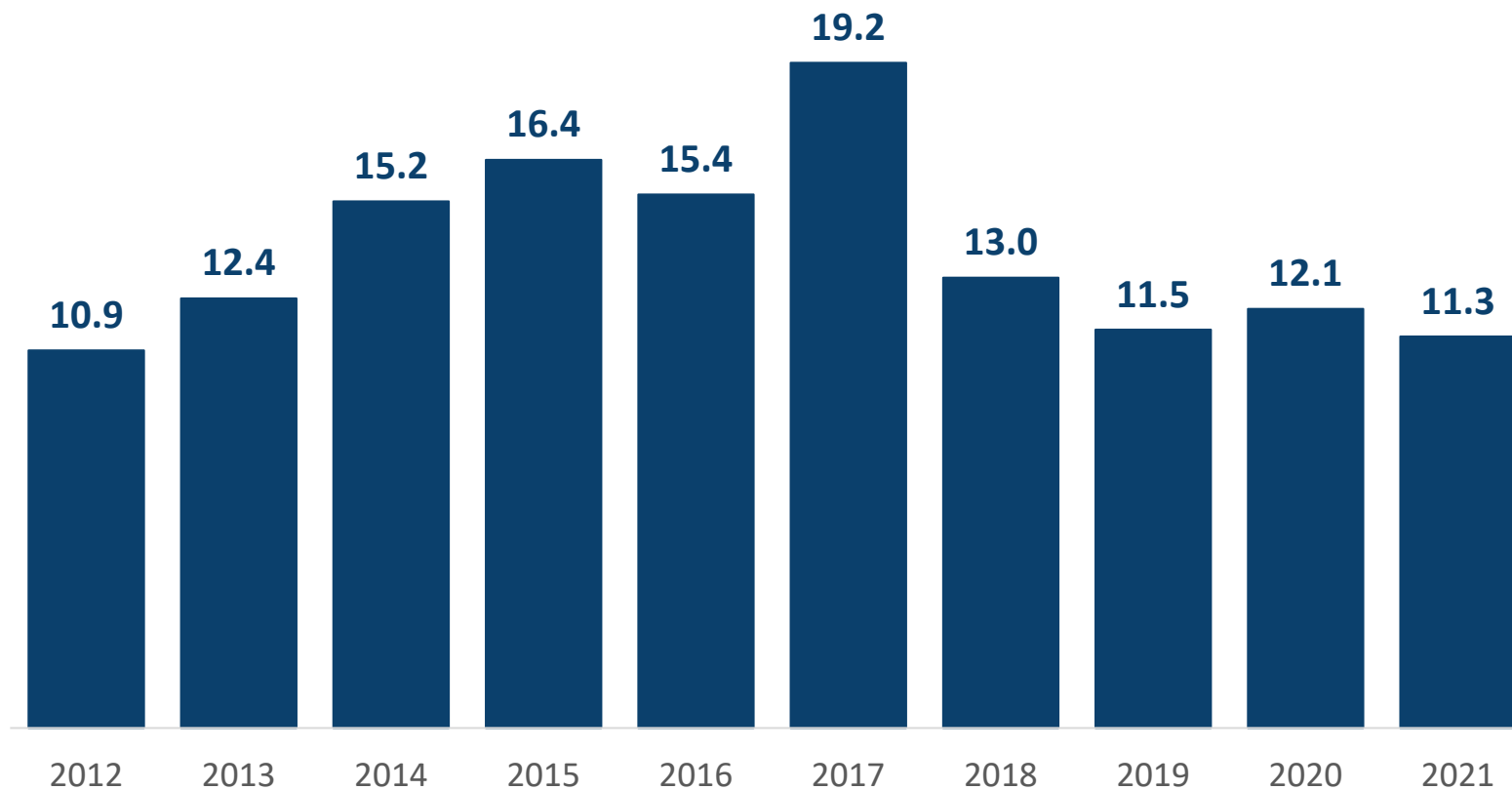
Neonatal Abstinence Syndrome Prosperity Region 6 2012-2021

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 6, 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	101	9,306	10.9
2013	116	9,366	12.4
2014	143	9,424	15.2
2015	149	9,067	16.4
2016	142	9,214	15.4
2017	172	8,938	19.2
2018	114	8,792	13.0
2019	101	8,810	11.5
2020	102	8,433	12.1
2021	96	8,527	11.3

Neonatal Abstinence Syndrome by Maternal Race/Ethnicity Prosperity Region 6, 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	NAS Rate (per 1,000 Live Births)		MI
White non-Hispanic	481	33,862	14.2	 14.2	8.1
Black non-Hispanic	73	6,608	11.0	 11.0	3.6
Hispanic	19	1,821	10.4	 10.4	5.2
American Indian	DNS	65	Data Not Sufficient		46.9
Asian/Pacific Islander	0	324	0		0.3

Neonatal Abstinence Syndrome by Race/Ethnicity Prosperity Region 6, 2017-2021

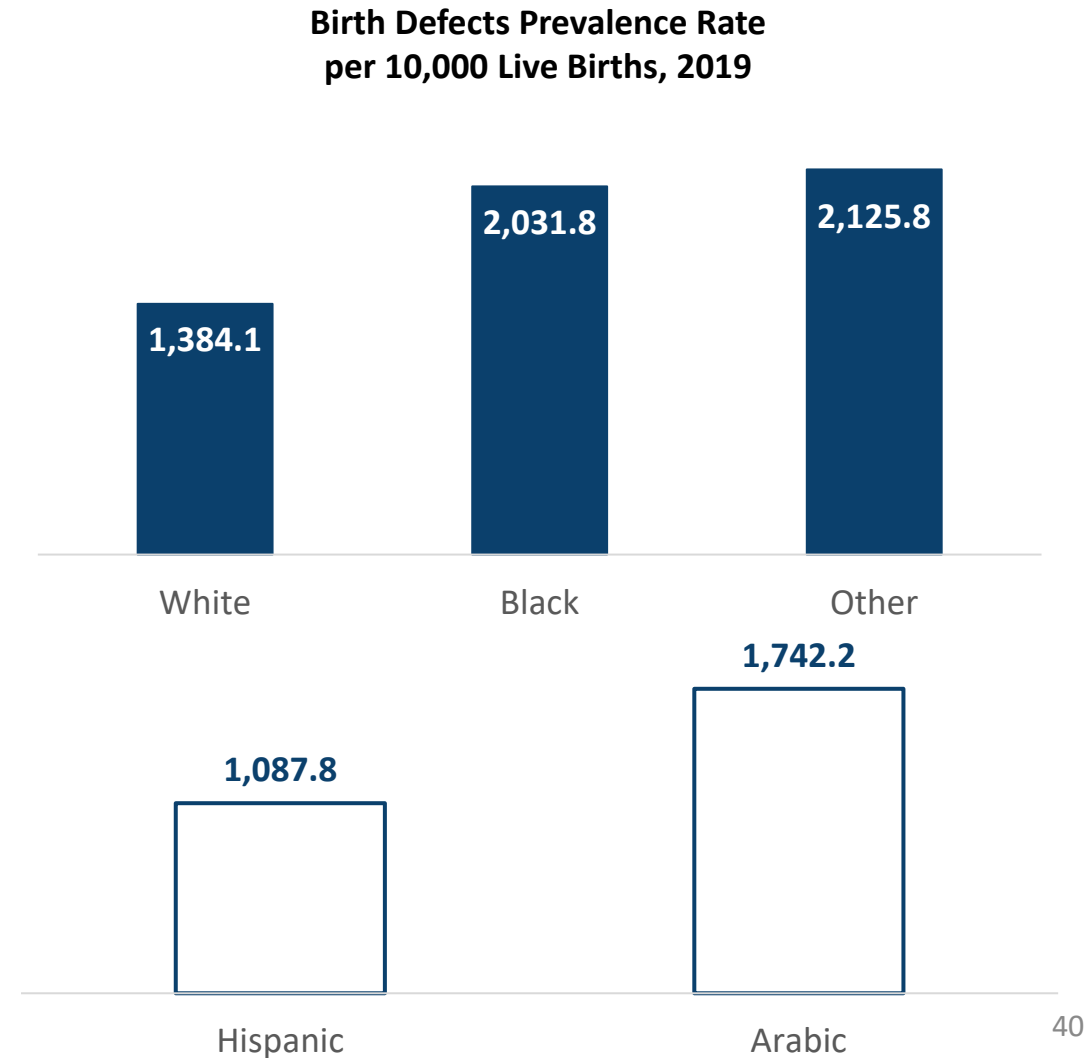
Note: 2010-2015: 779.5 (drug withdrawal syndrome in newborn) and 2016-current: P96.1 (neonatal withdrawal symptoms from maternal use of drugs of addiction)

Comparison of methods used to measure cases among Native Americans	# NAS Cases	# Live Births	Rate per 1,000 Live Births
#1: Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic	0<N<6	65	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	183	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	310	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).

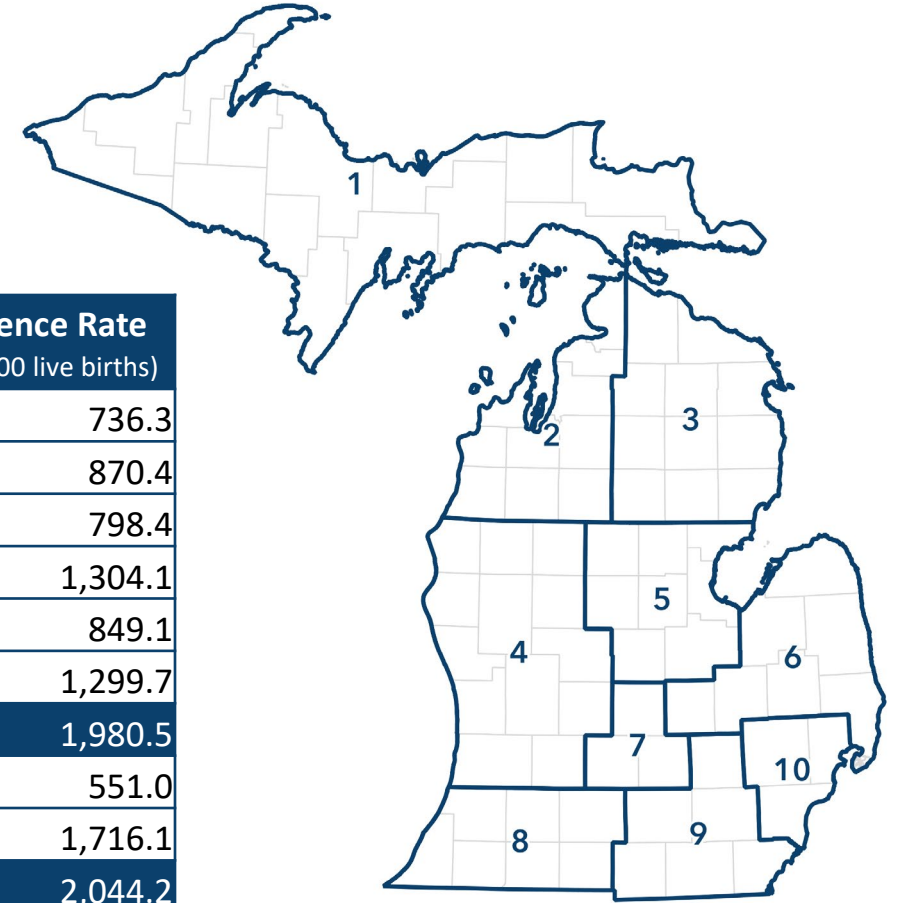


Birth Defect Prevalence Rates by Prosperity Region, 2019

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 2,044.2.5 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 6 2017-2021

Low Risk Cesarean by Maternal Race/Ethnicity Prosperity Region 6, 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	3,378	11,338	29.8%	29.8%
White non-Hispanic	2,713	9,057	30.0%	30.0%
Black non-Hispanic	383	1,405	27.3%	27.3%
Hispanic	164	521	31.5%	31.5%
American Indian	0<N<6	13	Data Not Sufficient	
Asian/Pacific Islander	46	114	40.4%	40.4%

Low Risk Cesarean by Race/Ethnicity Prosperity Region 6, 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	13	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).	16	51	31.4%
#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)	26	95	27.4%

Sleep-Related Infant Death Rate Prosperity Region 6 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

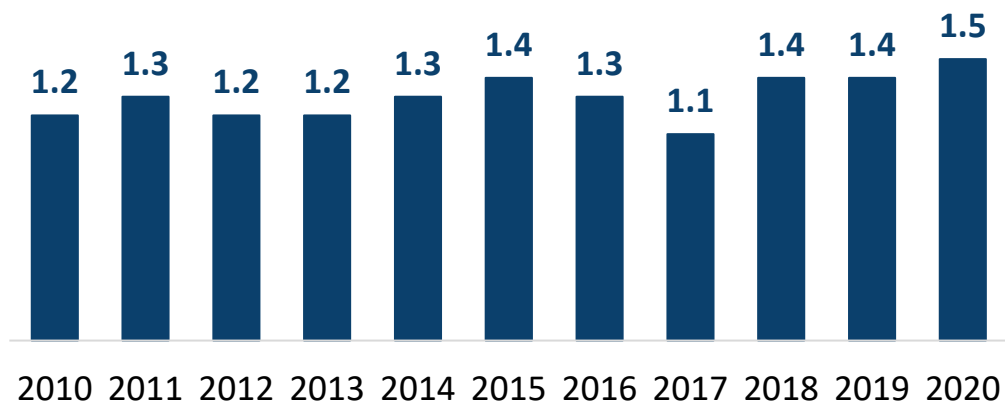
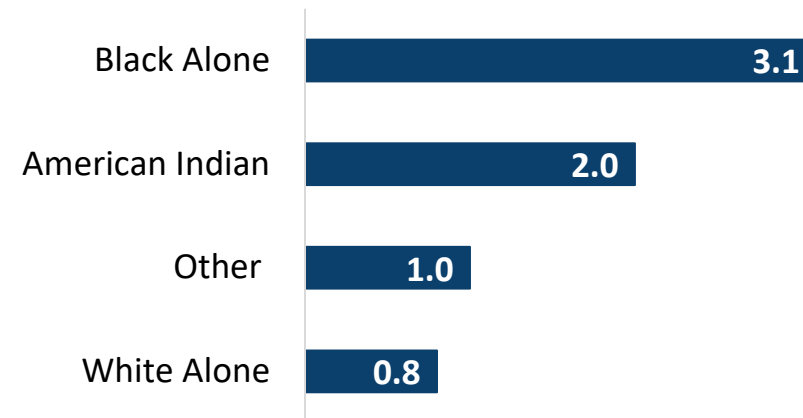


Figure 2. Rate of Sleep-Related Infant Deaths
per 1,000 Live Births

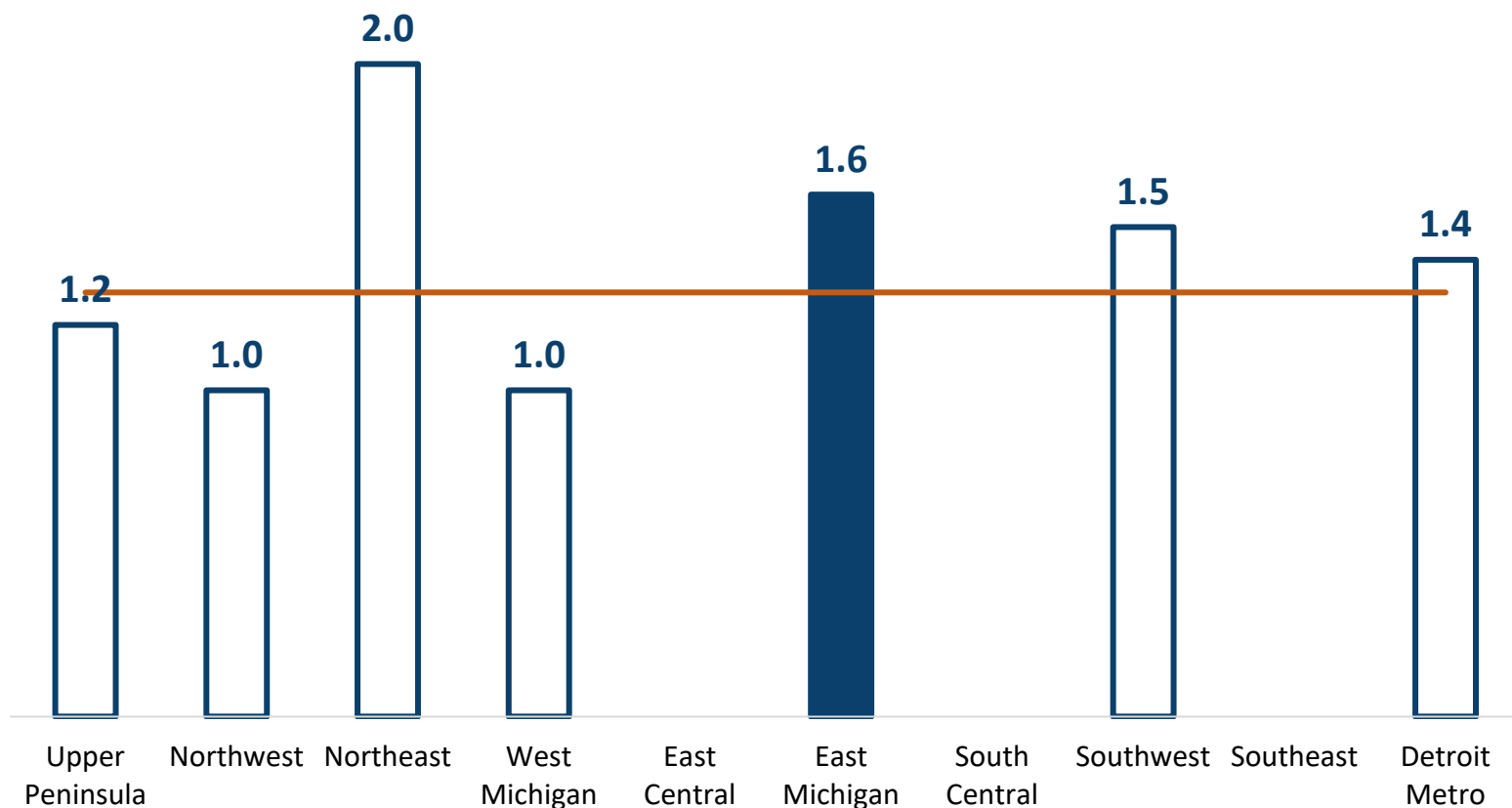


Sleep-Related Infant Death Rate by Prosperity Region, 2010-2020

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



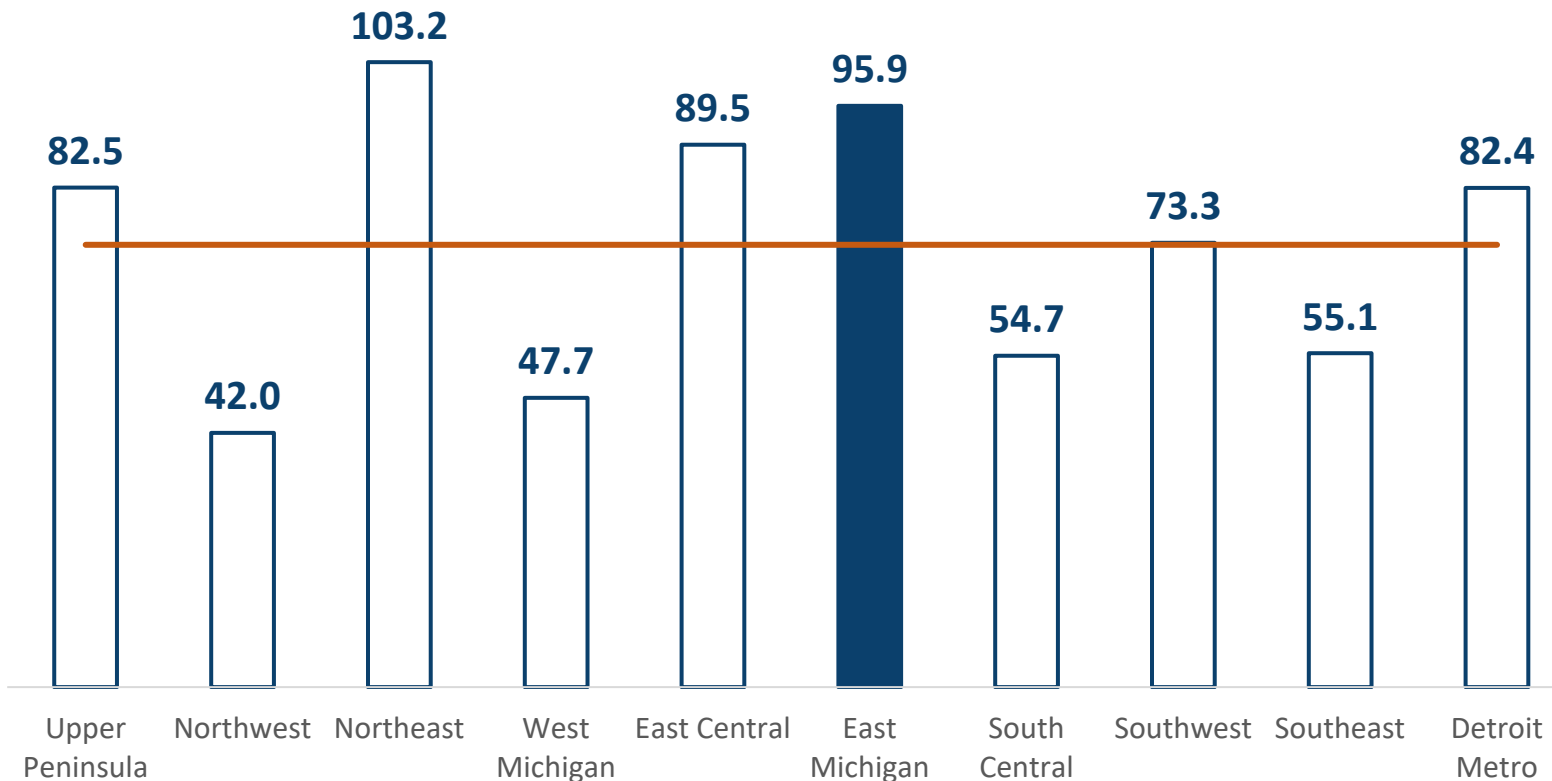
- Between 2010 and 2020 there were **164** sleep-related infant deaths in Region Six.
- The Region Six sleep-related infant death rate was statistically *significantly higher* than the Michigan sleep-related infant death rate.

Maternal Mortality Ratio Prosperity Region 6 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

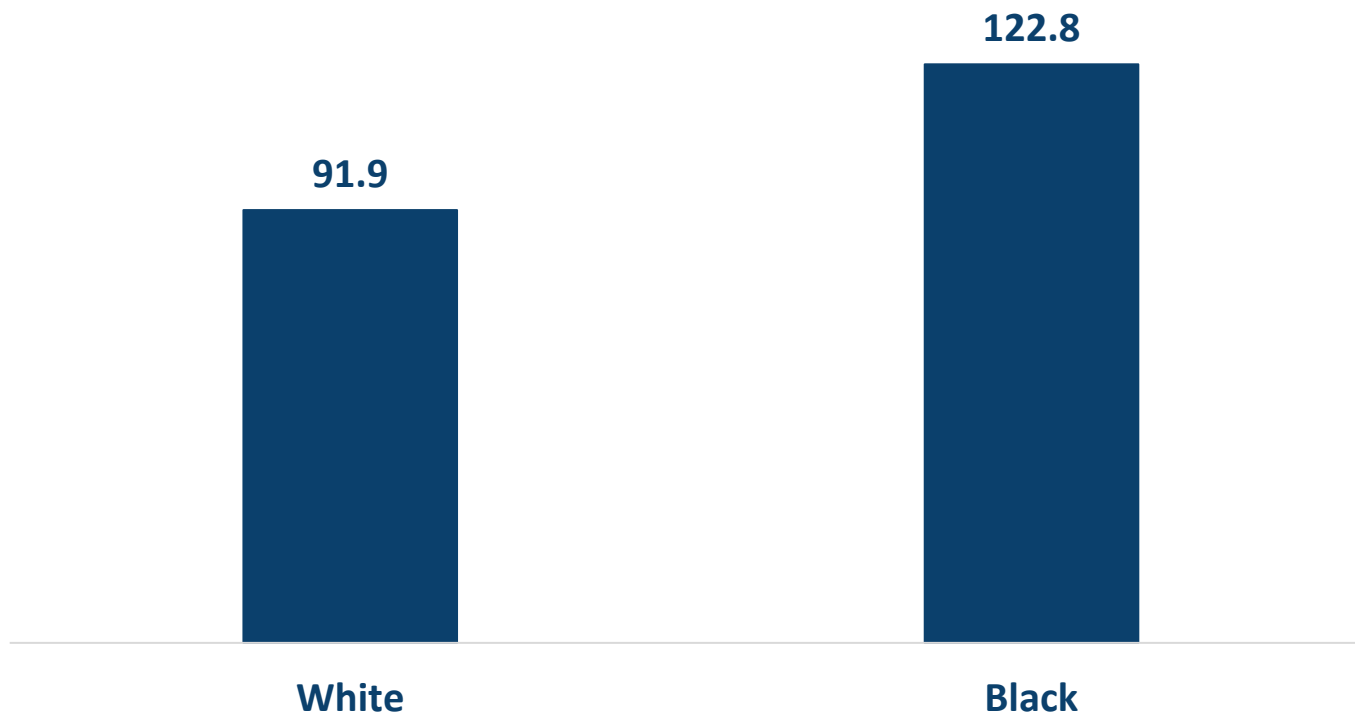


- Maternal deaths include deaths that occur during pregnancy, at delivery or within one year of pregnancy.
- Pregnancy associated (total) maternal mortality includes:
 - 1- pregnancy associated, not related mortality (*unrelated to the pregnancy*),
 - 2- pregnancy-related mortality (*related to or aggravated by the pregnancy*),
 - 3- deaths where pregnancy-relatedness is unable to be determined.
- In Region Six there were **43** maternal deaths between 2015 and 2019.

Maternal Mortality Ratio by Race Prosperity Region 6, 2015-2019

Other race and ethnicities suppressed due to sample size.

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



Between 2015 and 2019, Black mothers in Prosperity Region Six experienced **1.3** times higher maternal mortality as compared to white mothers.

There were **33** white maternal deaths and **9** Black maternal deaths in Prosperity Region Six between 2015 and 2019.