



# INFANT AND MATERNAL MORTALITY IN MICHIGAN

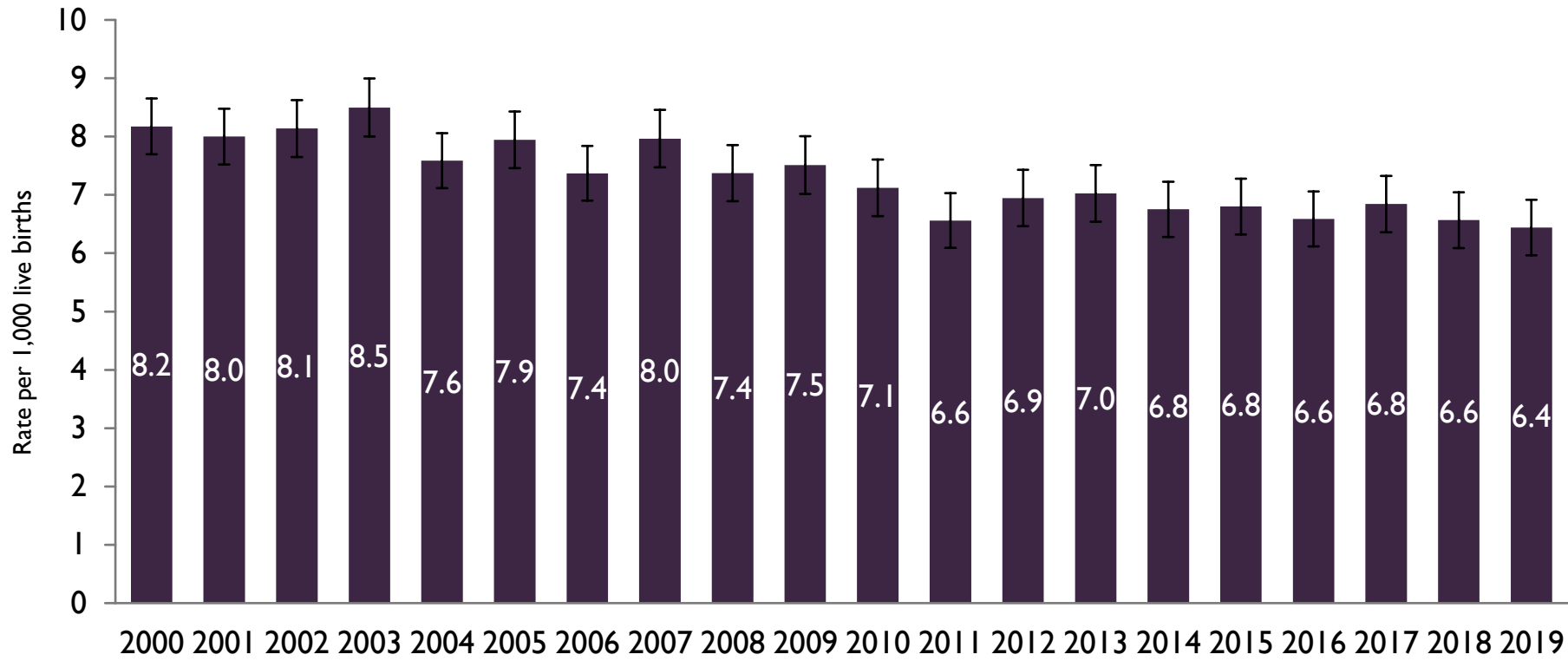


## INFANT MORTALITY IN MICHIGAN

- Defined as a death of a live-born baby before his or her first birthday
- Expressed as a rate per 1,000 live births.

# INFANT MORTALITY RATE, MICHIGAN, 2000-2019

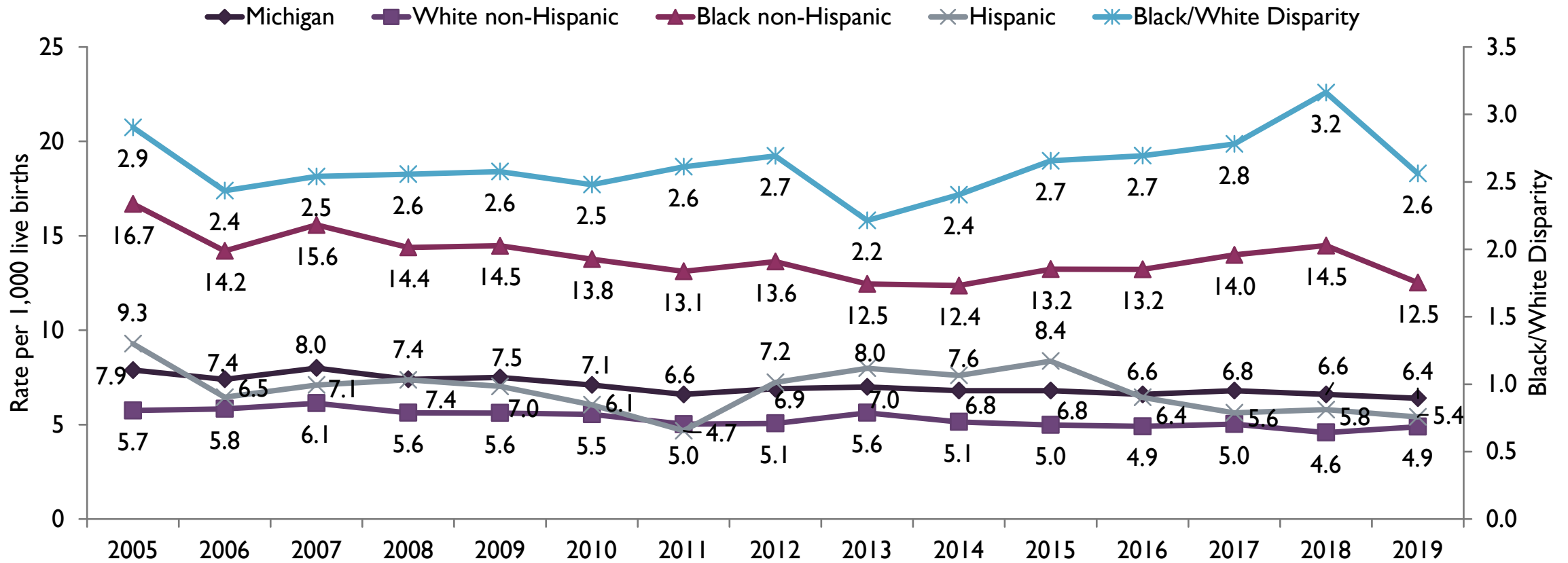
## (RATE PER 1,000 LIVE BIRTHS)



Year	# Live Births	# Infant Death	IMR
2000	136,048	1,112	8.2
2001	133,247	1,066	8.0
2002	129,518	1,054	8.1
2003	130,850	1,112	8.5
2004	129,710	984	7.6
2005	127,518	1,013	7.9
2006	127,537	940	7.4
2007	125,172	997	8.0
2008	121,231	894	7.4
2009	117,309	881	7.5
2010	114,717	817	7.1
2011	114,159	749	6.6
2012	112,708	783	6.9
2013	113,732	799	7.0
2014	114,460	773	6.8
2015	113,211	770	6.8
2016	113,374	747	6.6
2017	111,507	763	6.8
2018	110,093	723	6.6
2019	107,917	695	6.4

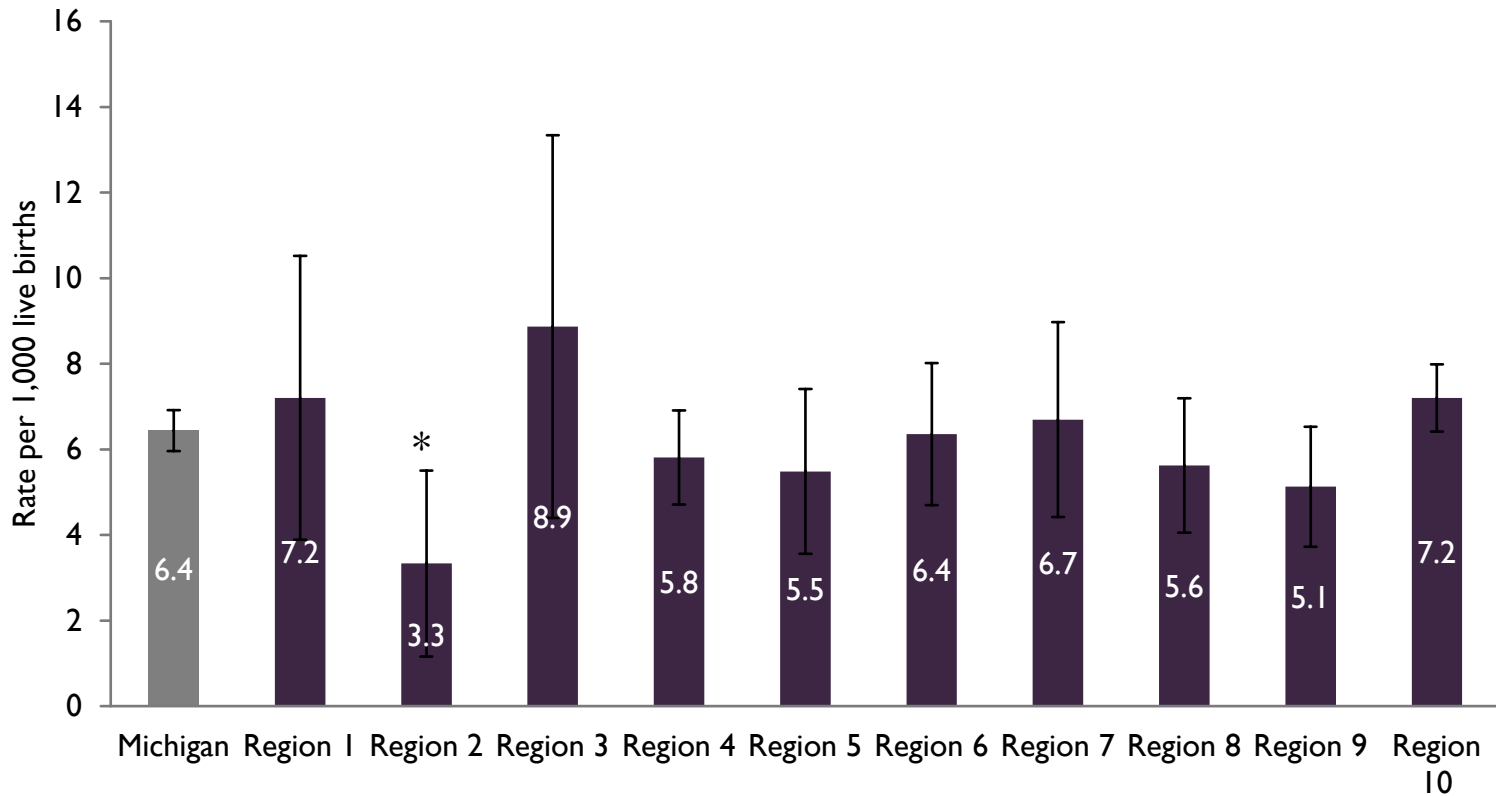
Infant mortality is defined as a death of a live-born baby before his or her first birthday and is expressed as a rate per 1,000 live births.

# TRENDS OF INFANT MORTALITY RATES BY MATERNAL RACE/ETHNICITY AND DISPARITIES, MICHIGAN, 2005-2019



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

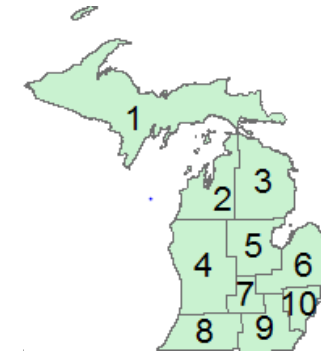
# INFANT MORTALITY RATES BY PROSPERITY REGION, MICHIGAN, 2019 (RATE PER 1,000 LIVE BIRTHS)



\* = significantly lower than the State of Michigan

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

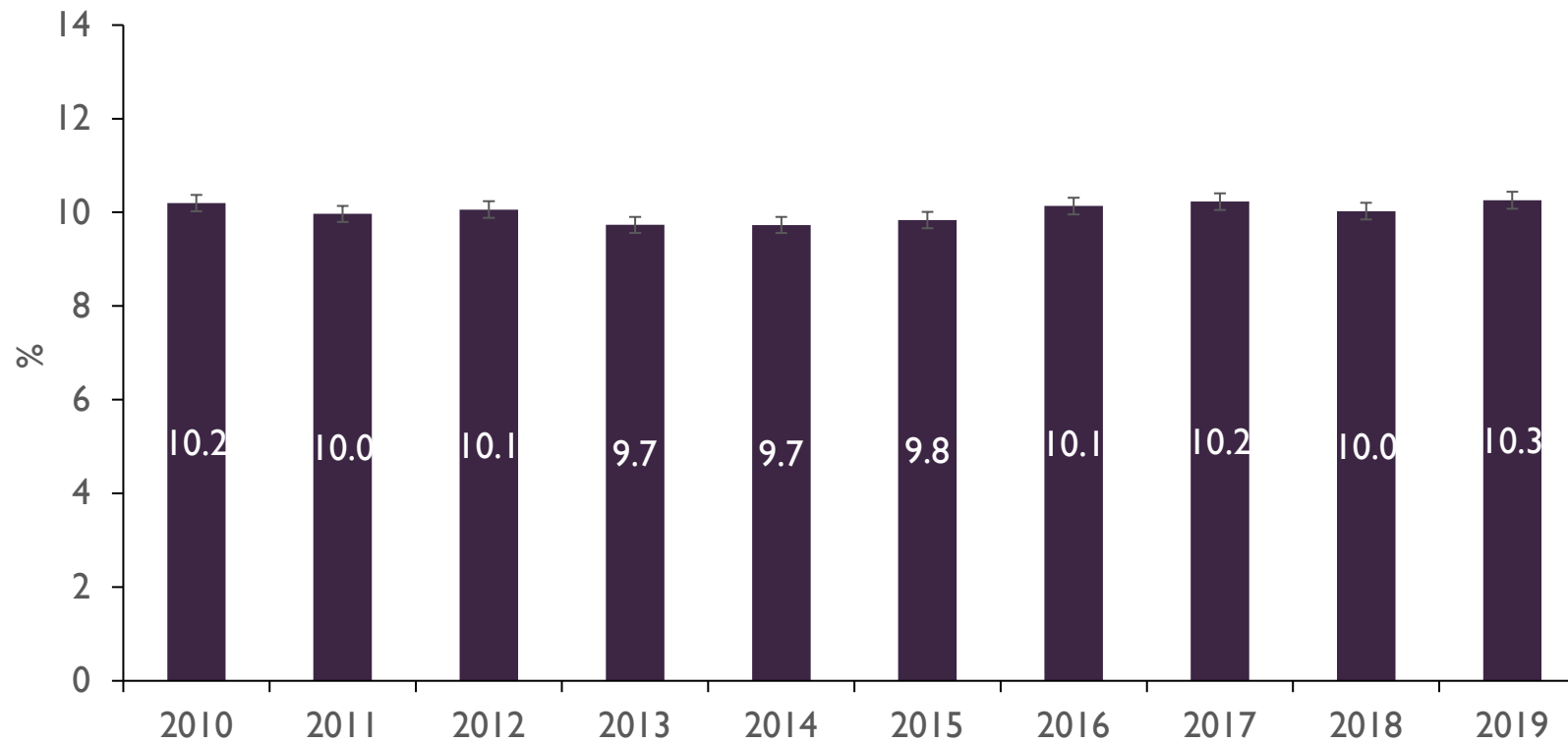
Prosperity Region	# Live Births	# Infant Death	2019 IMR
Michigan	107,917	695	6.4
1. Upper Peninsula Prosperity Alliance	2,499	18	7.2
2. Northwest Prosperity Region	2,700	9	3.3
3. Northeast Prosperity Region	1,691	15	8.9
4. West Michigan Prosperity Alliance	18,404	107	5.8
5. East Central Michigan Prosperity Region	5,653	31	5.5
6. East Michigan Prosperity Region	8,810	56	6.4
7. South Central Prosperity Region	4,928	33	6.7
8. Southwest Prosperity Region	8,711	49	5.6
9. Southeast Michigan Prosperity Region	9,947	51	5.1
10. Detroit Metro Prosperity Region	44,570	321	7.2



## PRETERM BIRTH IN MICHIGAN

- Defined as a birth of a live-born baby less than 37 completed weeks of gestation.
- Gestational age is based on the obstetric estimate of gestation.
- The incidence of preterm birth is calculated as the percentage of the number of preterm births among the number of all live births.

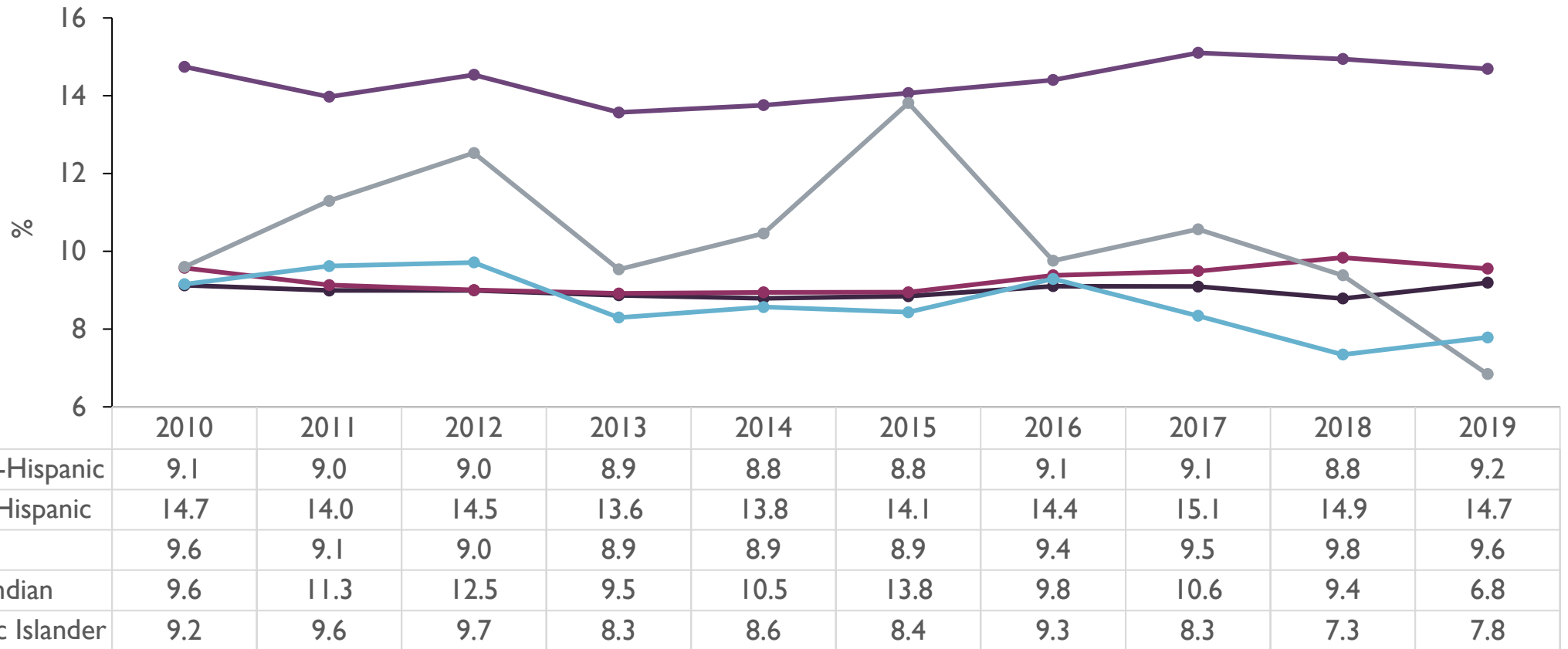
# PRETERM BIRTH, MICHIGAN, 2010-2019



Year	# Live Births	# PTB	PTB %
2010	114,717	11,696	10.2
2011	114,159	11,378	10.0
2012	112,708	11,338	10.1
2013	113,732	11,069	9.7
2014	114,460	11,136	9.7
2015	113,211	11,136	9.8
2016	113,374	11,490	10.1
2017	111,507	11,406	10.2
2018	110,093	11,038	10.0
2019	107,917	11,070	10.3

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.

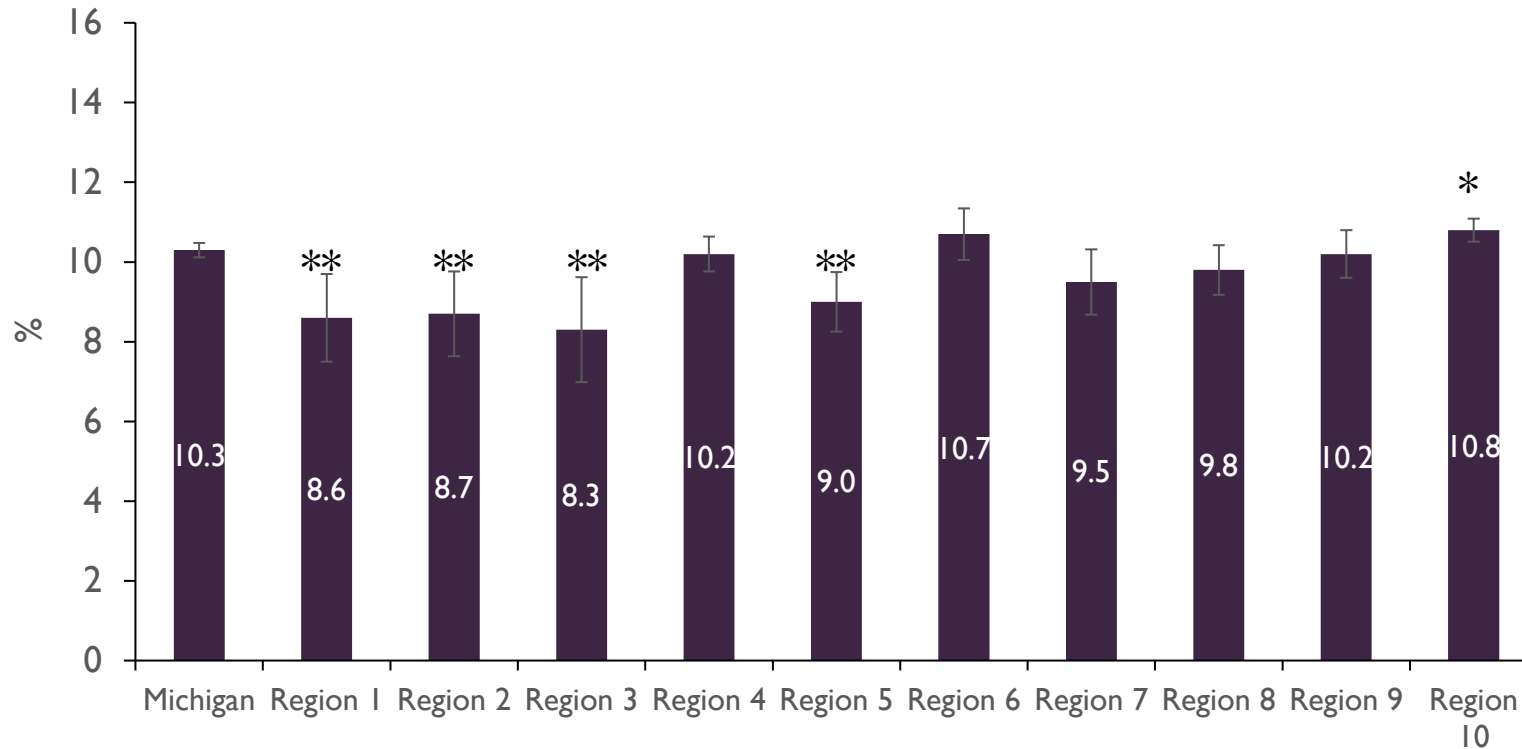
# PRETERM BIRTH BY MATERNAL RACE/ETHNICITY, MICHIGAN, 2010-2019



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 PROSPERITY REGION, MICHIGAN, 2019



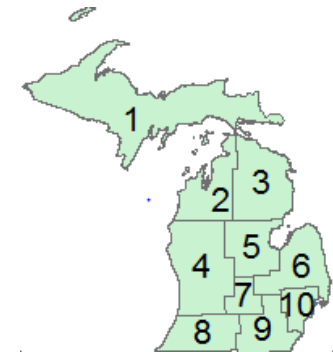
Prosperity Region	# Live Births	# PTB	PTB %
Michigan	107,917	11,070	10.3
1. Upper Peninsula Prosperity Alliance	2,499	216	8.6
2. Northwest Prosperity Region	2,700	236	8.7
3. Northeast Prosperity Region	1,691	141	8.3
4. West Michigan Prosperity Alliance	18,404	1,886	10.2
5. East Central Michigan Prosperity Region	5,653	507	9.0
6. East Michigan Prosperity Region	8,810	940	10.7
7. South Central Prosperity Region	4,928	469	9.5
8. Southwest Prosperity Region	8,711	851	9.8
9. Southeast Michigan Prosperity Region	9,947	1,019	10.2
10. Detroit Metro Prosperity Region	44,570	4,805	10.8

\* = significantly higher than the State of Michigan \*\* = significantly lower than the State of Michigan

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.

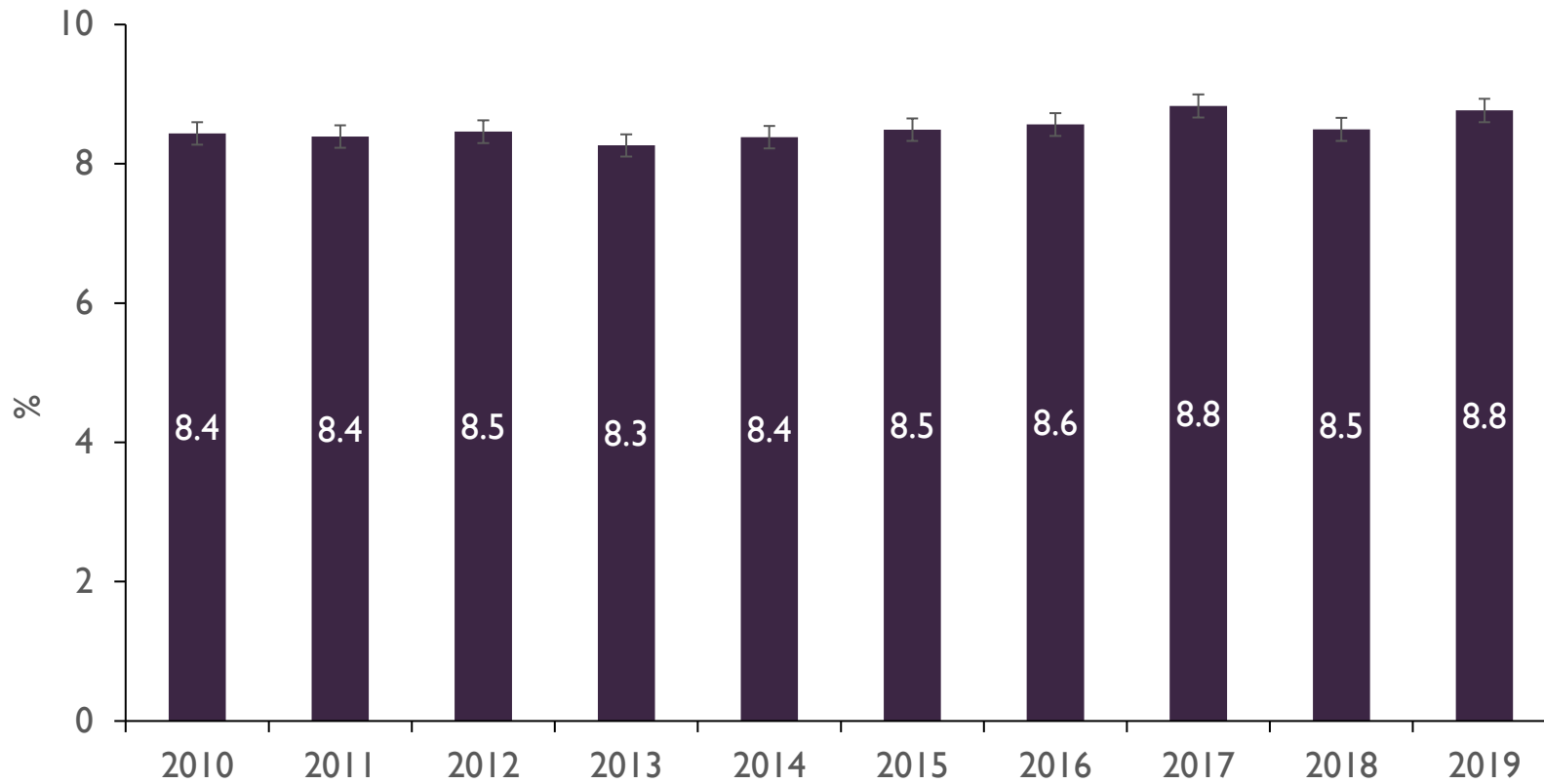
Data source: Michigan resident live birth files, Division for Vital Records and Health Statistics, MDHHS



## LOW BIRTHWEIGHT IN MICHIGAN

- Defined as a birthweight of a live-born baby less than 2,500 grams.
- The incidence of low birthweight is calculated as the percentage of the number of low birthweight births among the number of all live births.

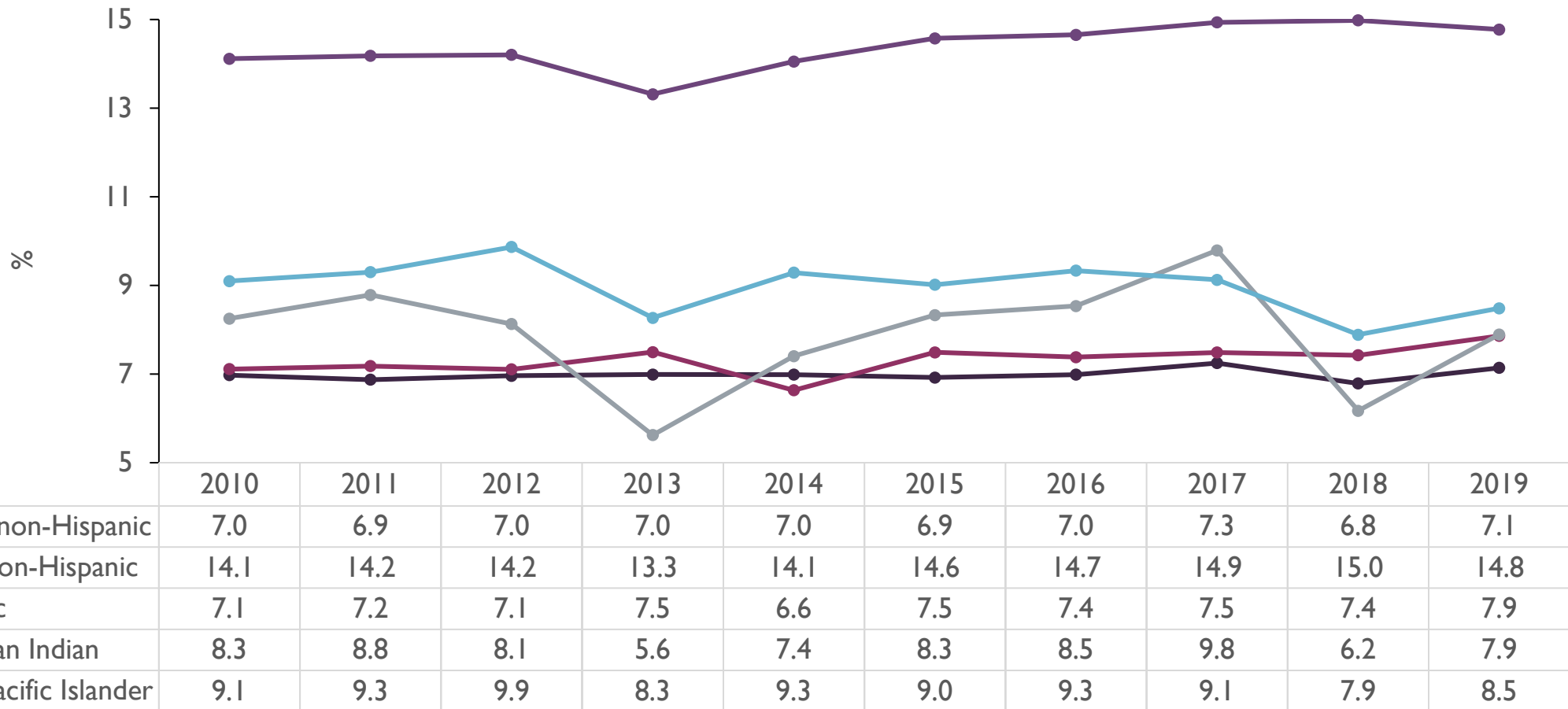
# LOW BIRTHWEIGHT, MICHIGAN, 2010-2019



Year	# Live Births	# LBW	LBW %
2010	114,717	9,678	8.4
2011	114,159	9,576	8.4
2012	112,708	9,535	8.5
2013	113,732	9,397	8.3
2014	114,460	9,592	8.4
2015	113,211	9,611	8.5
2016	113,374	9,708	8.6
2017	111,507	9,846	8.8
2018	110,093	9,350	8.5
2019	107,917	9,458	8.8

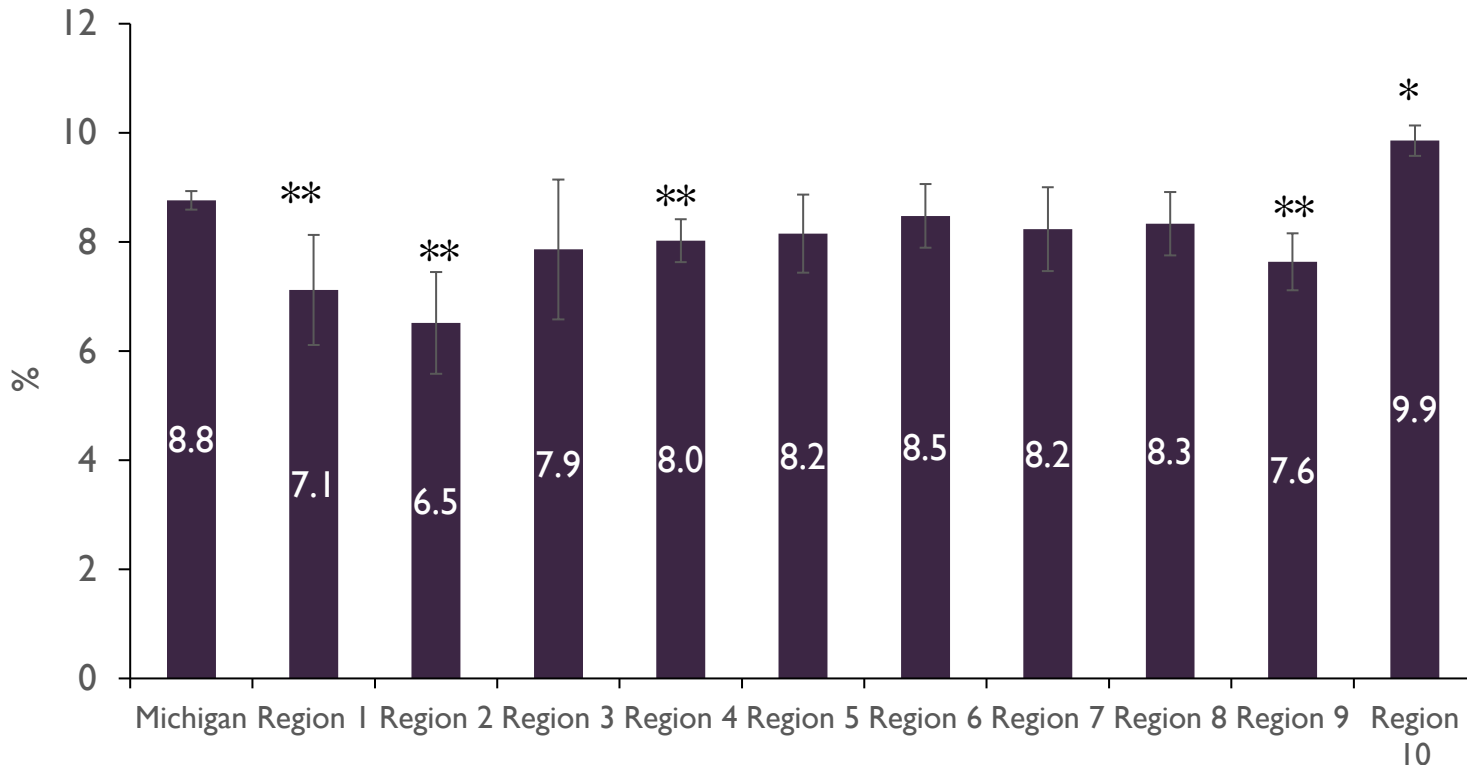
Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.

# LOW BIRTHWEIGHT BY MATERNAL RACE/ETHNICITY, MICHIGAN, 2010-2019

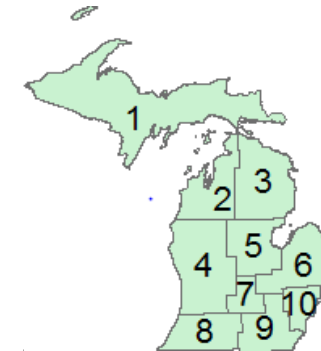


Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.

# LOW BIRTHWEIGHT BY PROSPERITY REGION, MICHIGAN, 2019



Prosperity Region	# Live Births	# LBW	LBW %
Michigan	107,917	9,458	8.8
1. Upper Peninsula Prosperity Alliance	2,499	178	7.1
2. Northwest Prosperity Region	2,700	176	6.5
3. Northeast Prosperity Region	1,691	133	7.9
4. West Michigan Prosperity Alliance	18,404	1,477	8.0
5. East Central Michigan Prosperity Region	5,653	461	8.2
6. East Michigan Prosperity Region	8,810	747	8.5
7. South Central Prosperity Region	4,928	406	8.2
8. Southwest Prosperity Region	8,711	726	8.3
9. Southeast Michigan Prosperity Region	9,947	760	7.6
10. Detroit Metro Prosperity Region	44,570	4,394	9.9



\* = significantly higher than the State of Michigan \*\* = significantly lower than the State of Michigan

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

# MATERNAL DEATHS IN MICHIGAN

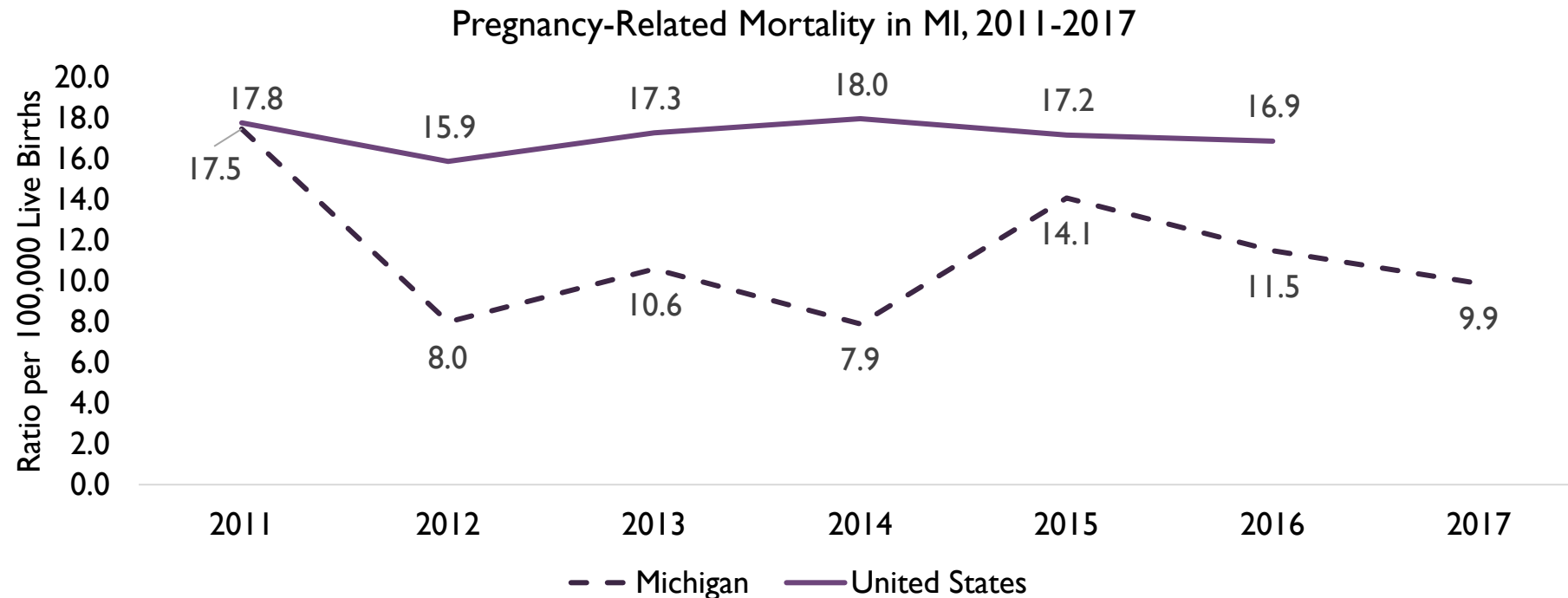
A **maternal death** is the death of a woman (or person) who is currently pregnant or was pregnant within 365 days of death.

**Pregnancy-related mortality** is the death of a woman while pregnant or within one year of the end of a pregnancy from any cause **related to or aggravated by** the pregnancy or its management. This does not include accidental or incidental causes.

**Pregnancy-associated, not related mortality** is the death of a woman while pregnant or within one year of the end of a pregnancy due to a cause **unrelated to** pregnancy.

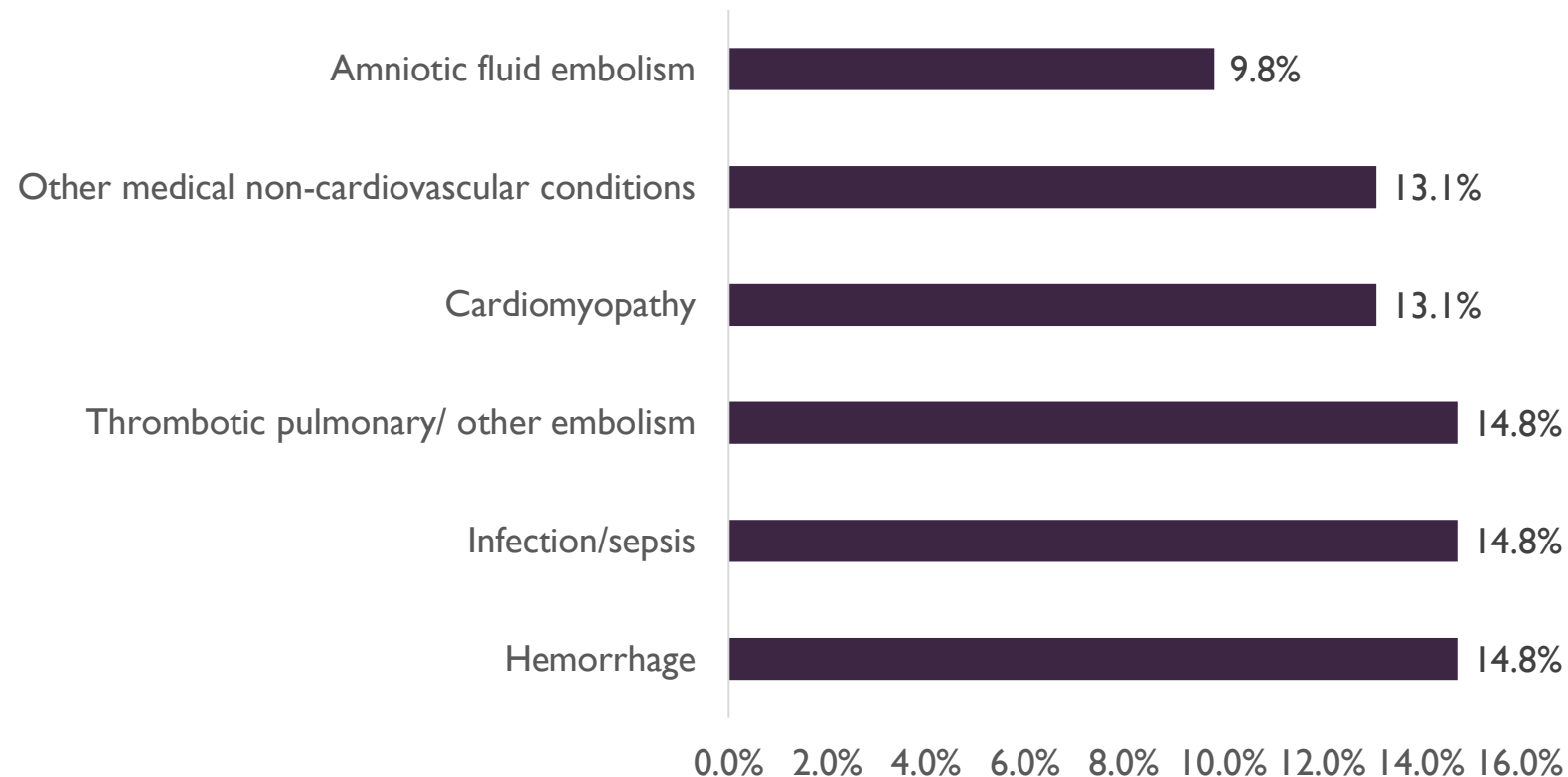
# PREGNANCY-RELATED MORTALITY IN MICHIGAN

From 2013-2017, 61 women died of pregnancy-related causes (ratio of 10.8 deaths per 100,000 live births)



# PREGNANCY-RELATED MORTALITY IN MICHIGAN

Causes of Pregnancy-Related Deaths in Michigan, 2013-2017



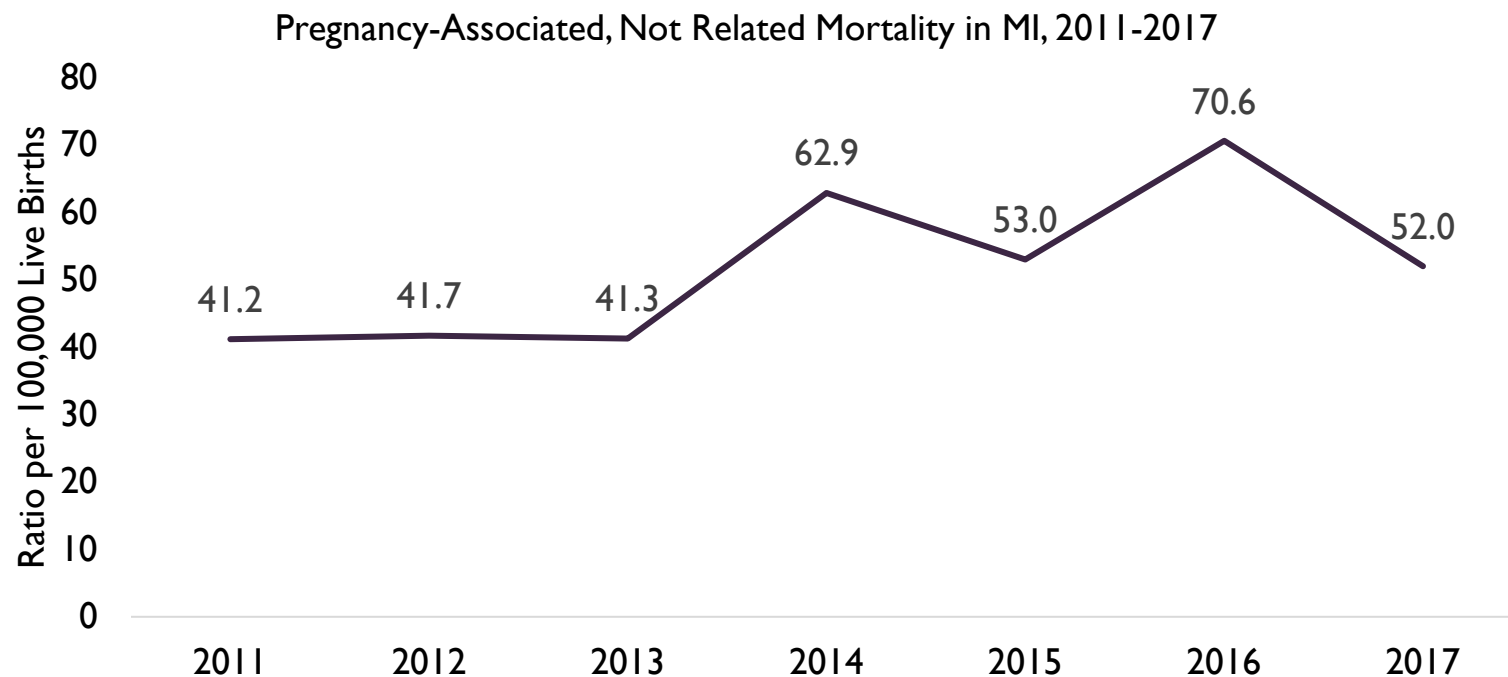
**Hemorrhage, infection/sepsis and thrombotic/pulmonary embolism are the leading causes of pregnancy-related deaths in Michigan.**

Hypertensive disorders of pregnancy, cerebrovascular conditions and cardiovascular conditions suppressed due to less than 6 cases



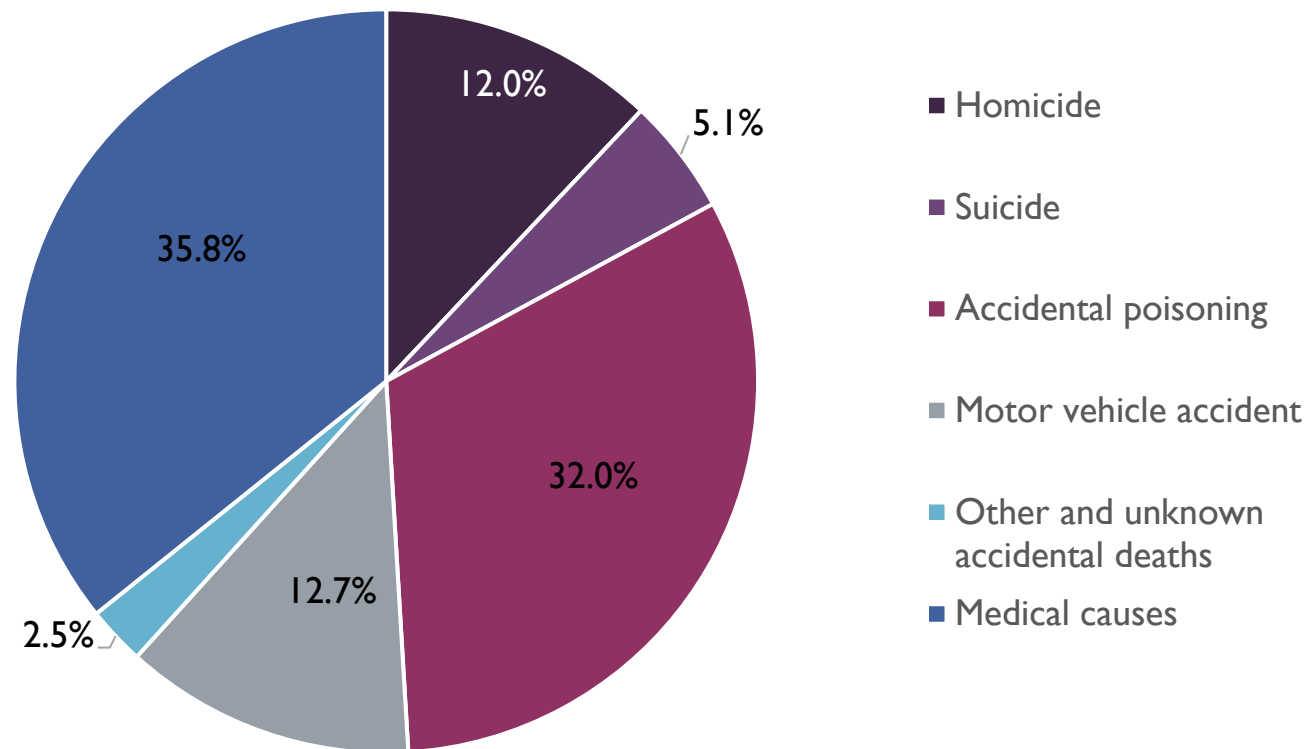
# PREGNANCY-ASSOCIATED, NOT RELATED DEATHS IN MICHIGAN

From 2013-2017, 316 women died of pregnancy-associated, not related causes (ratio of 55.8 per 100,000 live births)



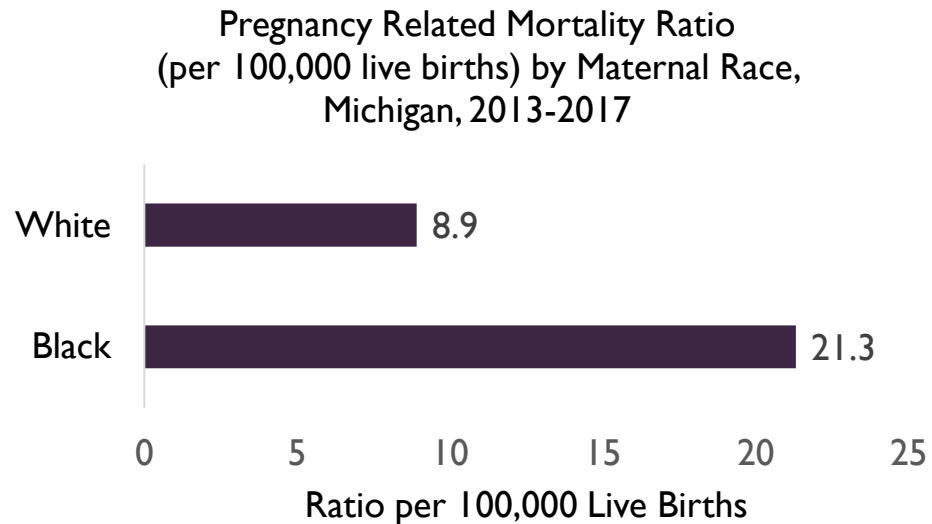
# PREGNANCY-ASSOCIATED, NOT RELATED DEATHS IN MICHIGAN

Causes of Pregnancy-Associated, Not Related Deaths in Michigan 2013-2017

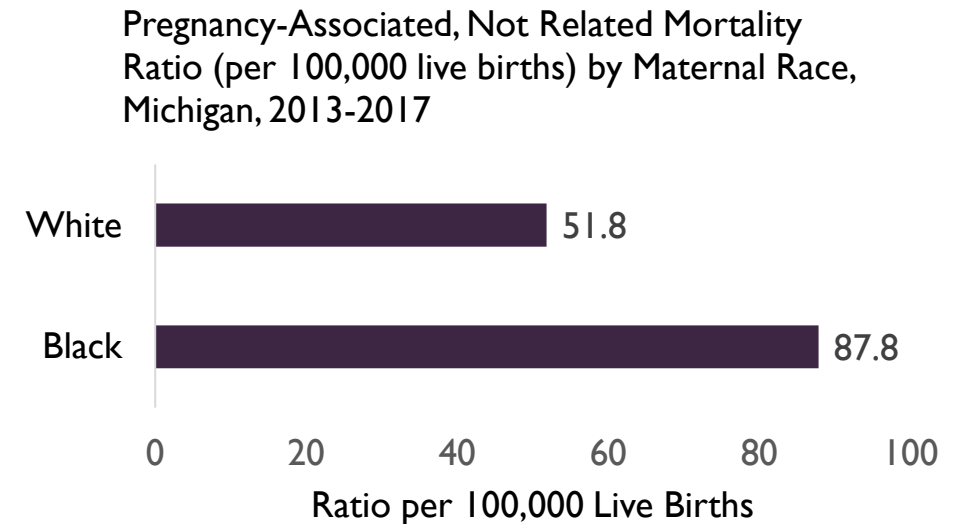


# RACIAL DISPARITIES IN MATERNAL MORTALITY

Black women are **2.4x** more likely to die from pregnancy-related causes as white women

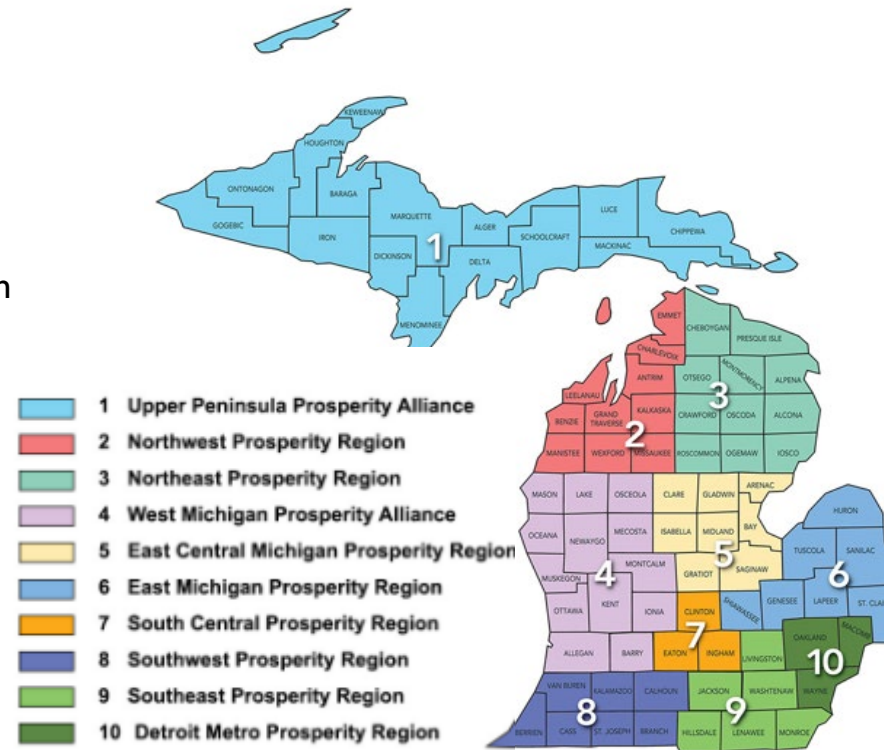
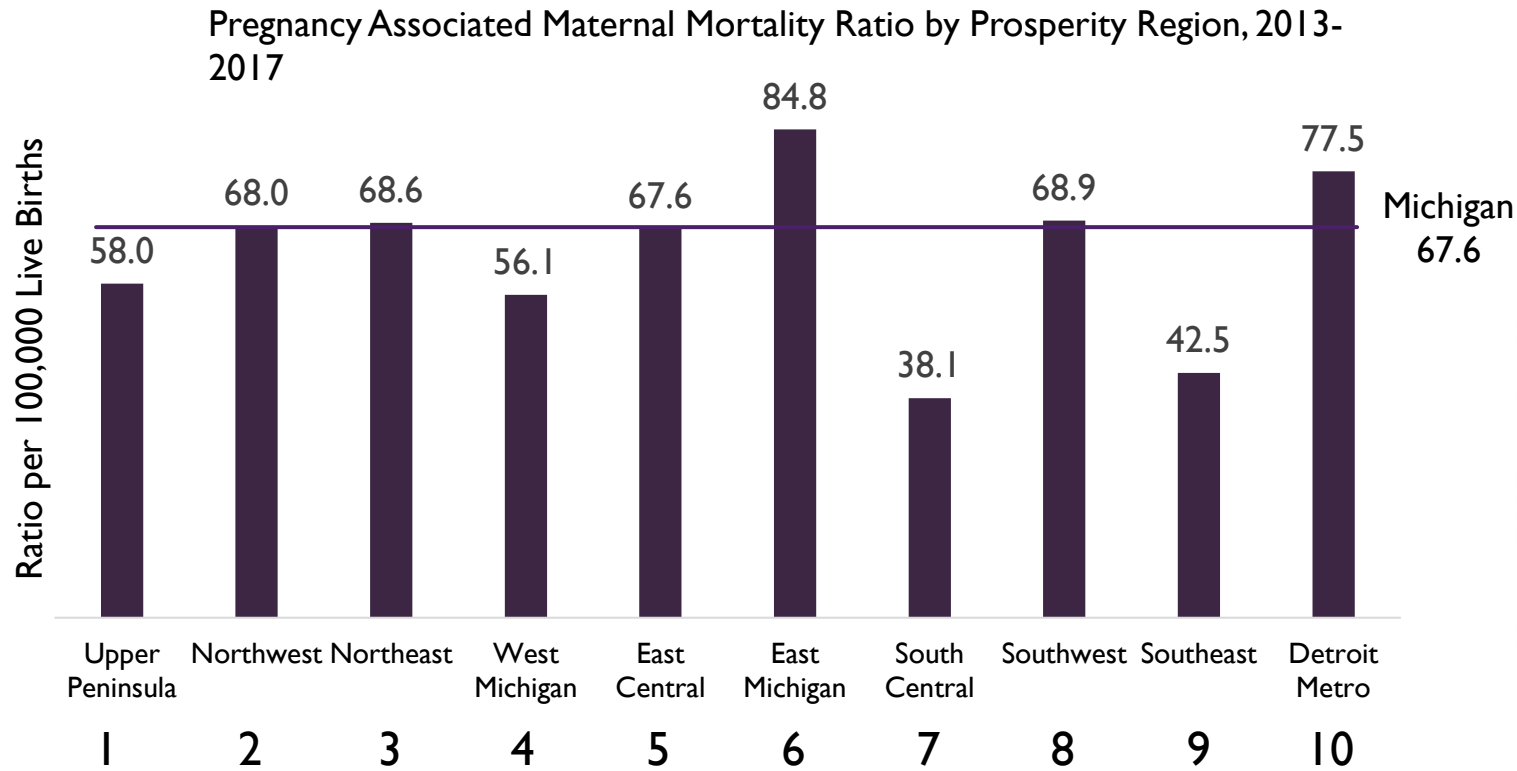


Black women are **1.7x** more likely to die from pregnancy associated, Not Related causes as white women



# TOTAL MATERNAL MORTALITY RATE BY PROSPERITY REGION 2012-2016

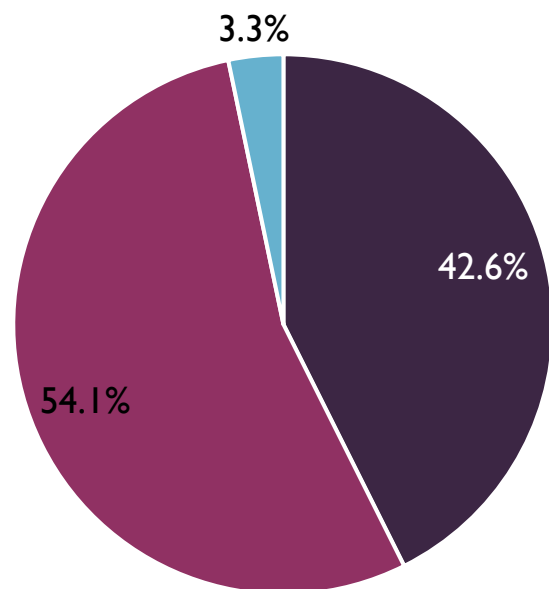
(RATIO PER 100,000 LIVE BIRTHS)



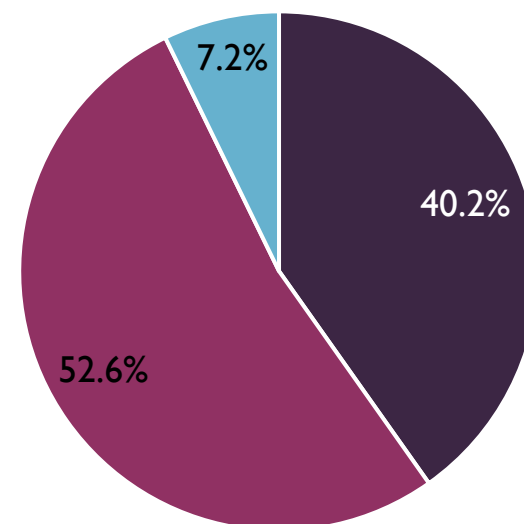
# PREVENTABILITY

The committees consider whether an intervention at the provider, patient, facility, system, community, or policy level could have prevented the death.

**Pregnancy-related deaths from 2013-2017**



**Pregnancy-associated, not related deaths from 2013-2017**



■ No ■ Yes ■ Unable to Determine

LISTENING TO  
MOTHERS:  
THE MI PRAMS SURVEY

- Pregnancy Risk Assessment Monitoring System
- Annual survey of mothers of live births
  - Michigan residents
  - In-state births
  - < quadruplets
- Population-level statistics
  - Stratified random selection
  - Overselection
- Experiences before and during pregnancy, and in the first few months after birth

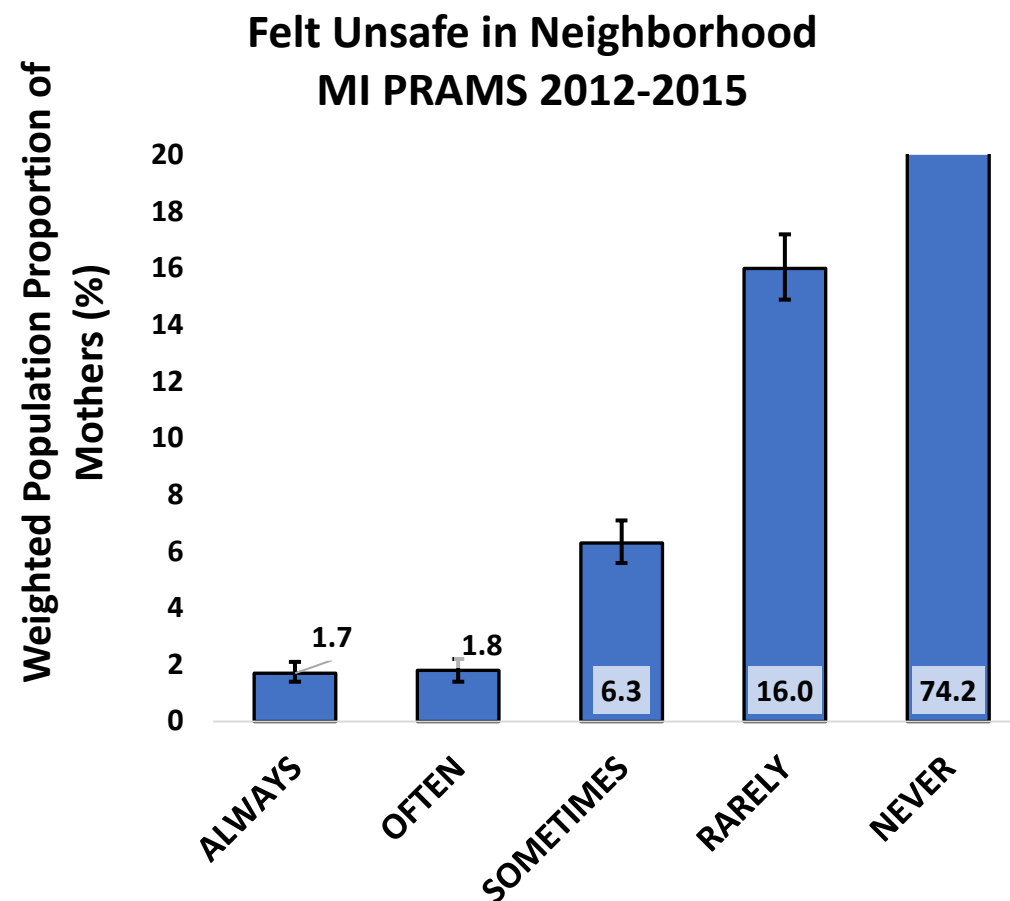
# WHAT DO MOMS SHARE THROUGH MI PRAMS?

- **Topic Map**
  - [www.Michigan.gov/PRAMS](http://www.Michigan.gov/PRAMS) --> Reports
- Prepregnancy health
- Pregnancy intention
- Health insurance source
  - Before, during, after pregnancy
- Timely vs. late start to PNC
  - Barriers to timely PNC
- Substance use
  - Alcohol, tobacco, e-cigarettes
  - Cannabis, prescription opioid pain relievers
- Content of healthcare visits
  - Prenatal care visits
  - Postpartum care visits
- Breastfeeding initiation, duration
  - Reasons for not starting
  - Reasons for stopping
- Life stressors
- Unmet needs during pregnancy
- Perinatal mental health
- Adverse childhood experiences
- Race-related stressors

# NEIGHBORHOOD SAFETY

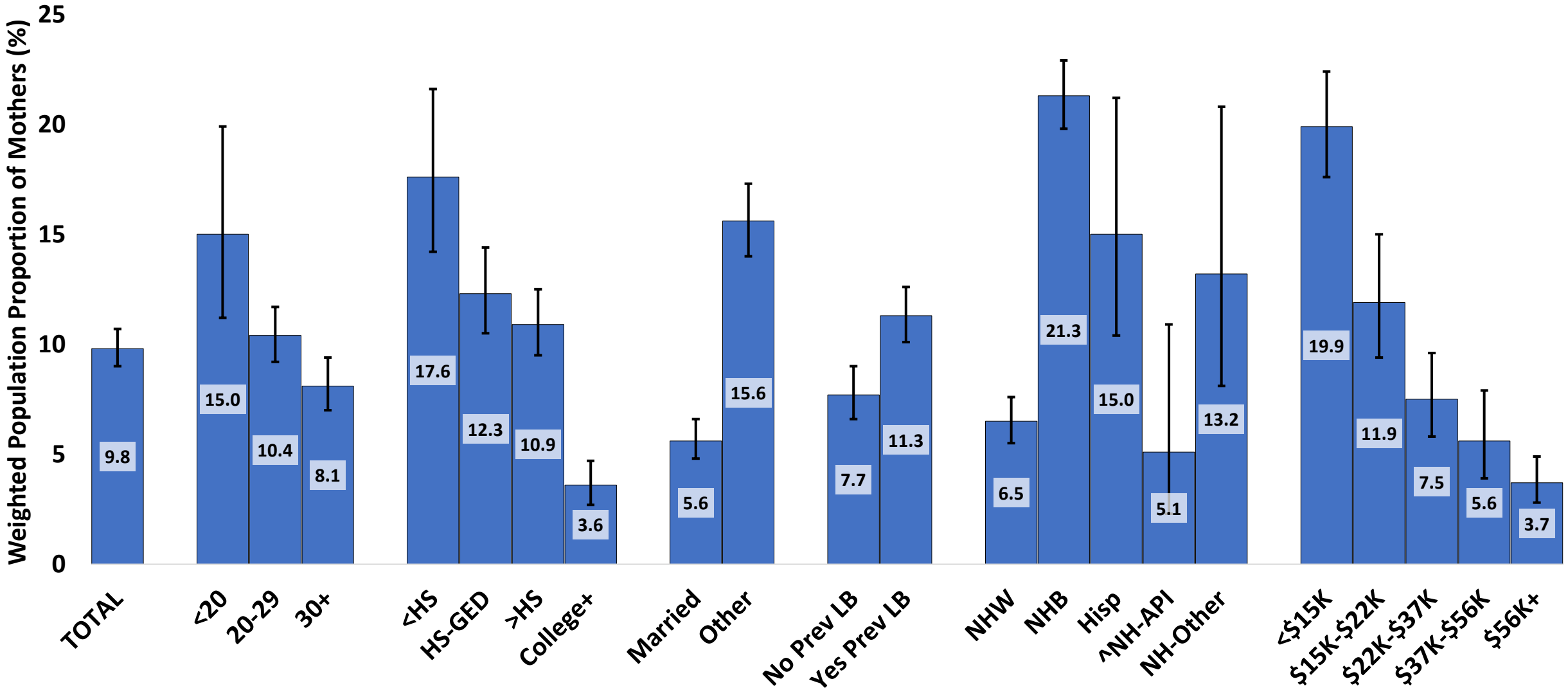
44. During the 12 months before your new baby was born, how often did you feel unsafe in the neighborhood where you lived?

- Always
- Often
- Sometimes
- Rarely
- Never





## Always / Often / Sometimes Felt Unsafe in Neighborhood by Maternal Demographics, MI PRAMS 2012-2015

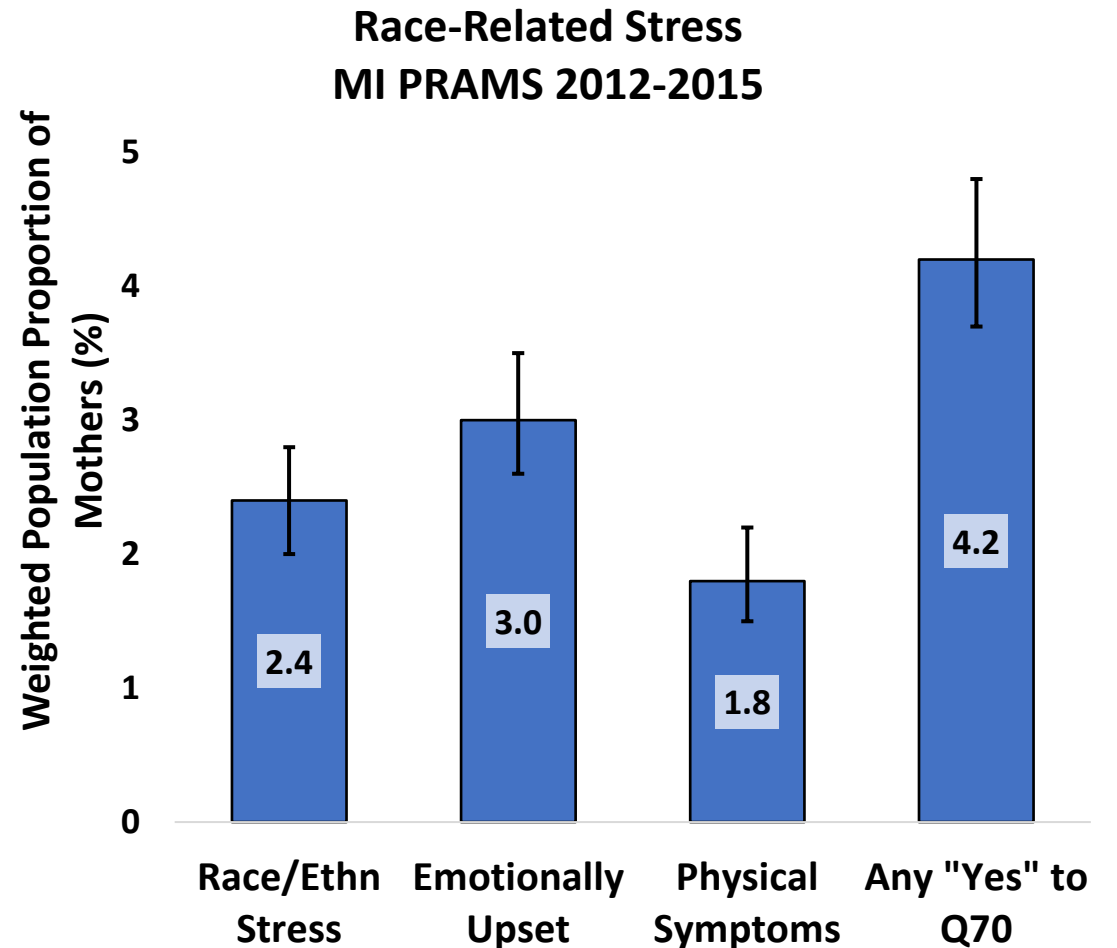


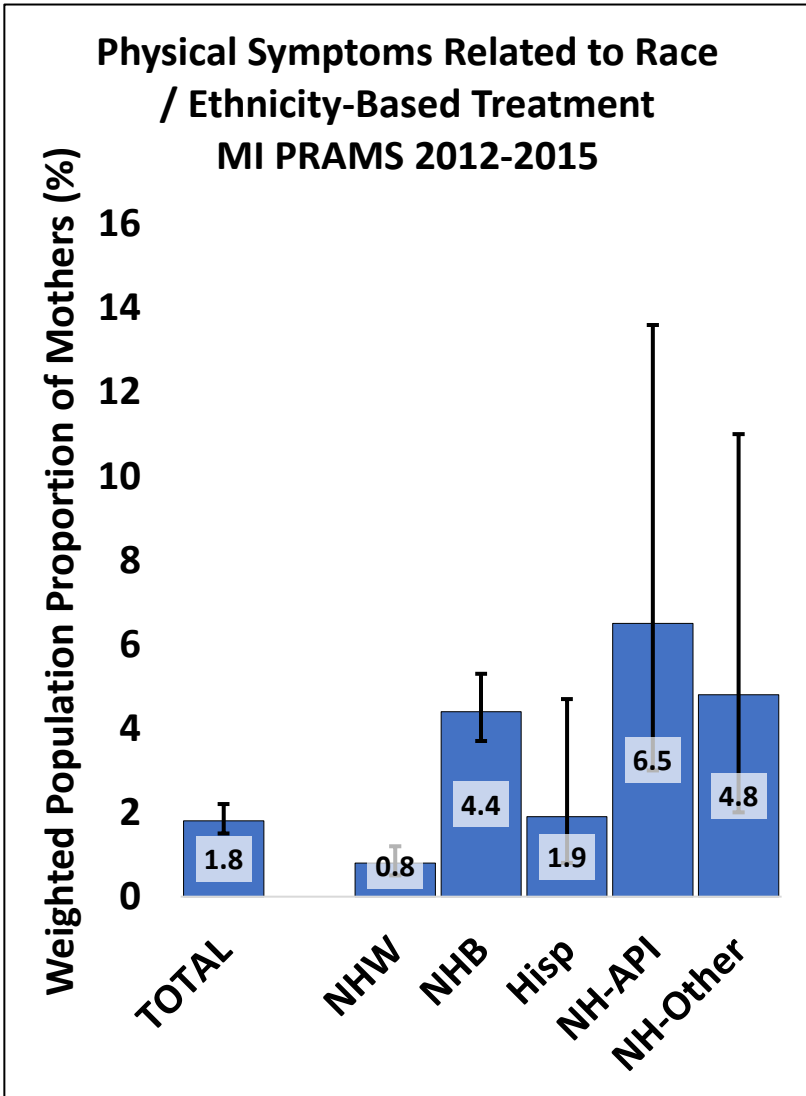
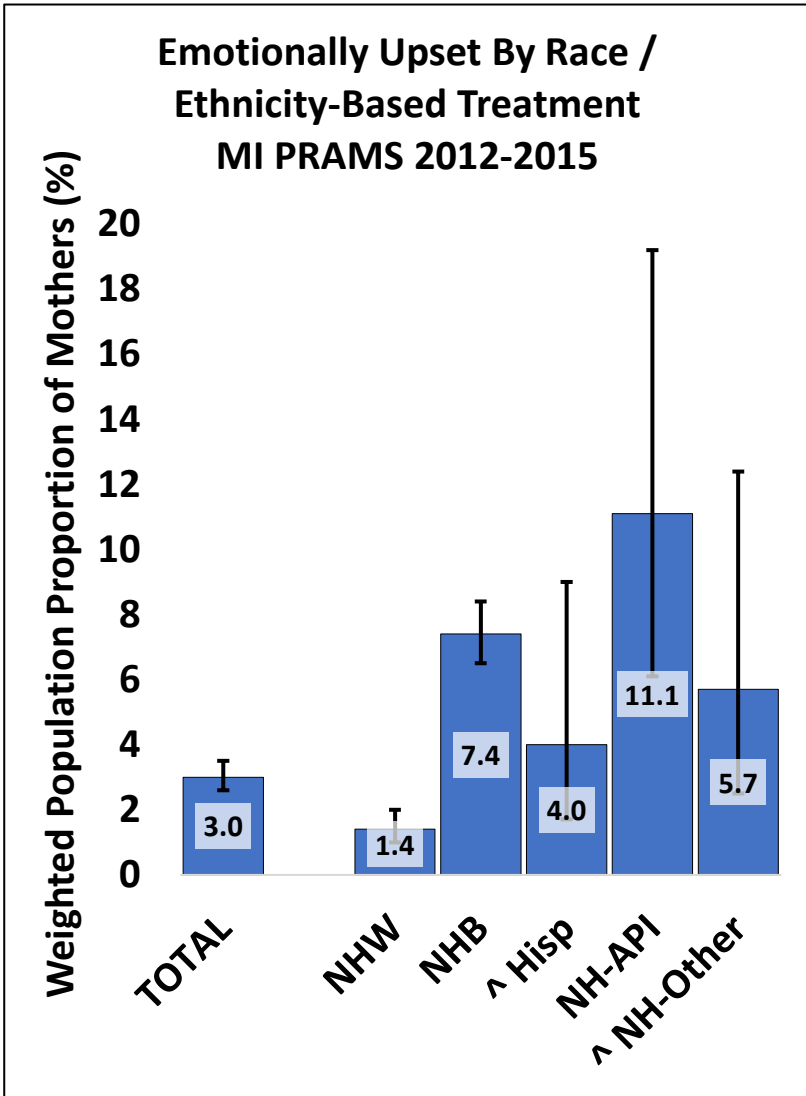
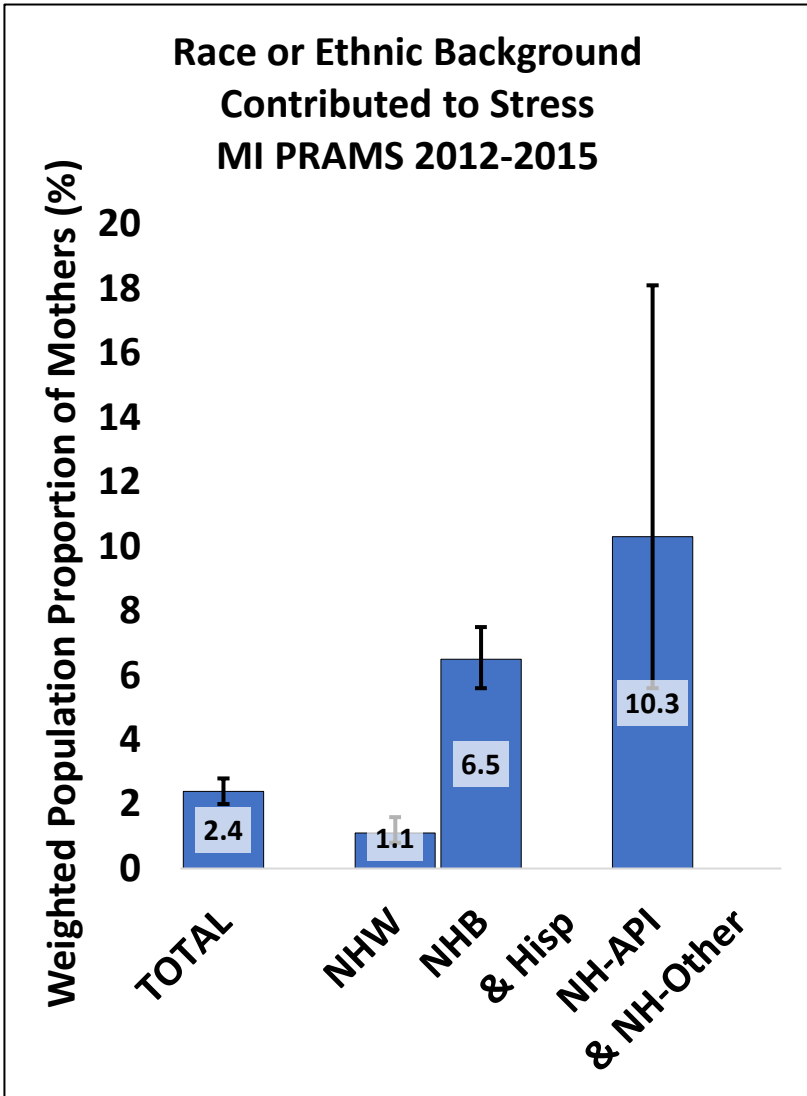
^ Relative standard error (RSE) between 30% and 50% - interpret with caution

# RACE-RELATED STRESSORS DURING PREGNANCY

70. This question is about things that may have happened during the *12 months before your new baby was born*. For each item, check **No** if it did not happen to you or **Yes** if it did. (It may help to use the calendar.)

- |  | No                       | Yes                      |
|--|--------------------------|--------------------------|
| a. I felt that my race or ethnic background contributed to the stress in my life.....  | <input type="checkbox"/> | <input type="checkbox"/> |
| b. I felt emotionally upset (for example, angry, sad, or frustrated) as a result of how I was treated based on my race or ethnic background.....   | <input type="checkbox"/> | <input type="checkbox"/> |
| c. I experienced physical symptoms (for example, a headache, an upset stomach, or a pounding heart) that I felt were related to how I was treated based on my race or ethnic background..... | <input type="checkbox"/> | <input type="checkbox"/> |





^ Relative standard error (RSE) between 30% and 50% - interpret with caution

& Estimated suppressed due to <6 responders or RSE > 50%

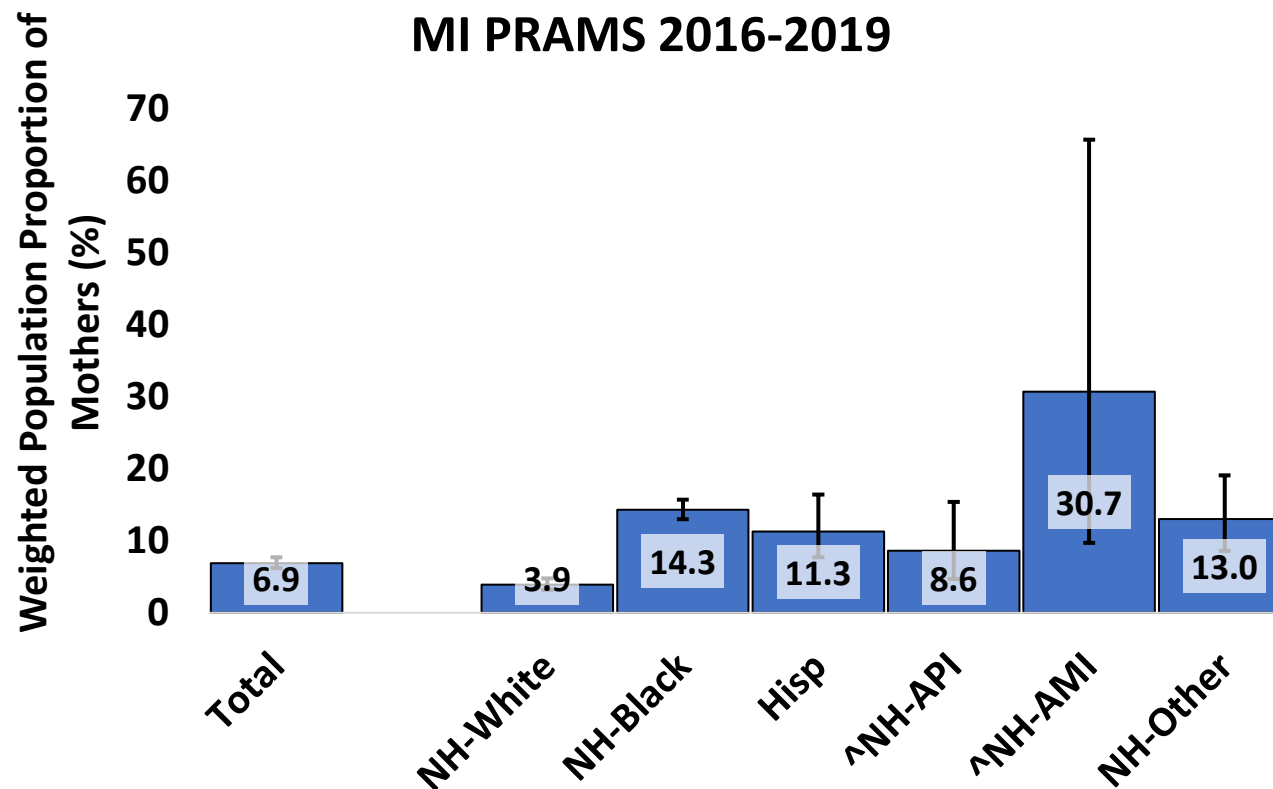
# RACE-RELATED MISTREATMENT IN HEALTH CARE SETTINGS

62. During the 12 months before your new baby was born, how often did you feel that when you went to get health care you were treated worse than people of other races or cultures?

- Never
- Sometimes
- Usually
- Always
- I did not get health care then

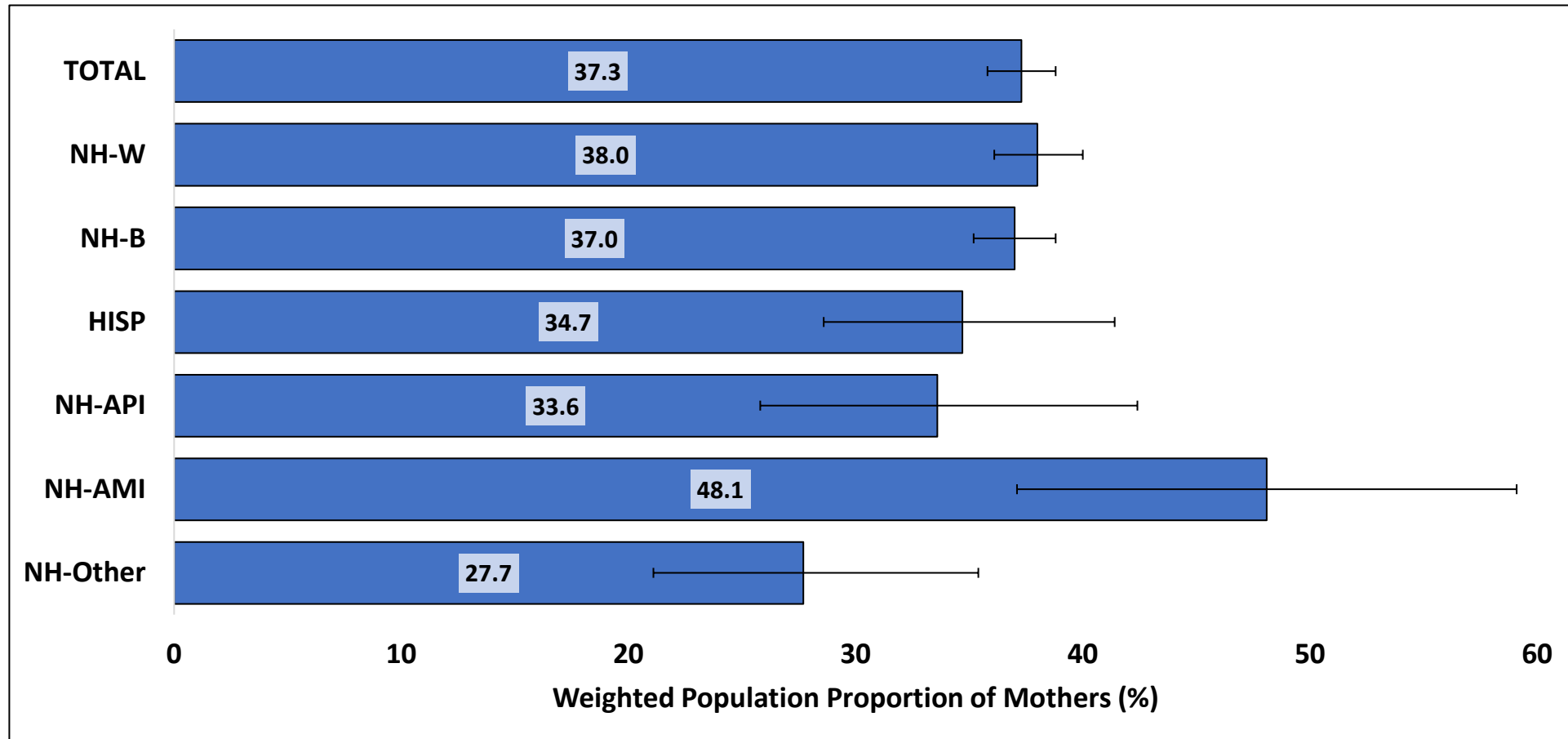
For NH-AMI group, estimates include mothers of infants with any maternal ***or paternal*** American Indian ancestry

Any Race-Related Health Care Mistreatment by Maternal Race / Ethnicity  
MI PRAMS 2016-2019



^ Relative standard error (RSE) above 30% - interpret with caution

# ANY ANXIETY BEFORE PREGNANCY AND / OR ANY DEPRESSION BEFORE, DURING, AFTER PREGNANCY BY MATERNAL RACE / ETHNICITY | MICHIGAN PRAMS, 2016-2109



For NH-AMI group, estimates include mothers of infants with any maternal ***or paternal*** American Indian ancestry

# APPLYING THESE CONCEPTS TO MATERNAL AND INFANT WELLNESS

- Things we want for every pregnancy:
  - Intentional
  - Sufficiently spaced from prior pregnancies
  - Supported by timely entry to prenatal care
  - Supported by comprehensive prenatal care
  - Minimal unmet needs
  - Supported by postpartum care for mother
- To support wellness, reduce contributors to infant and maternal mortality
- Challenges:
  - What other upstream factors may contribute to disparate maternal and infant outcomes?
  - How do we address / support:
    - Unsafe neighborhoods
    - Race-related stressors
    - Race-based mistreatment in healthcare
    - Anxiety and depression around pregnancy