



Indiana
Department
of
Health

INDIANA INFANT MORTALITY AND BIRTH OUTCOMES, 2022

MATERNAL & CHILD HEALTH
EPIDEMIOLOGY

03/27/2024

OUR MISSION:

To promote, protect, and improve the health and safety of all Hoosiers.

OUR VISION:

Every Hoosier reaches optimal health regardless of where they live, learn, work, or play.



Data details

- 2022 infant mortality is based on death records from 2022
 - These deaths encompass births that could have taken place in 2021 and 2022
 - These deaths encompass pregnancies that could have taken place from 2020-2022
- Infant mortality is calculated by taking the number of infant deaths divided by the number of live births for a given calendar year
- Both birth and infant death records are reported to the Indiana Department of Health Vital Records division
- This data is based on residency rather than location of occurrence

Infant mortality quick facts

- Infant Mortality is defined as the death of a baby before his/her first birthday.
- **Infant Mortality Rate** is an estimate of the number of infant deaths for every 1,000 live births.
- Infant Mortality is the **No. 1 indicator** of health status in the world.

Infant mortality in Indiana



Infant mortality in Indiana

- 577 Hoosier babies died before their 1st birthdays in 2022:
 - About 48 babies EVERY month
 - About 11 babies EVERY week
- More than 2,700 infant lives lost in the last 5 years:
 - Over 38 school buses at maximum capacity

Infant mortality rates (IMRs)

2013-2022



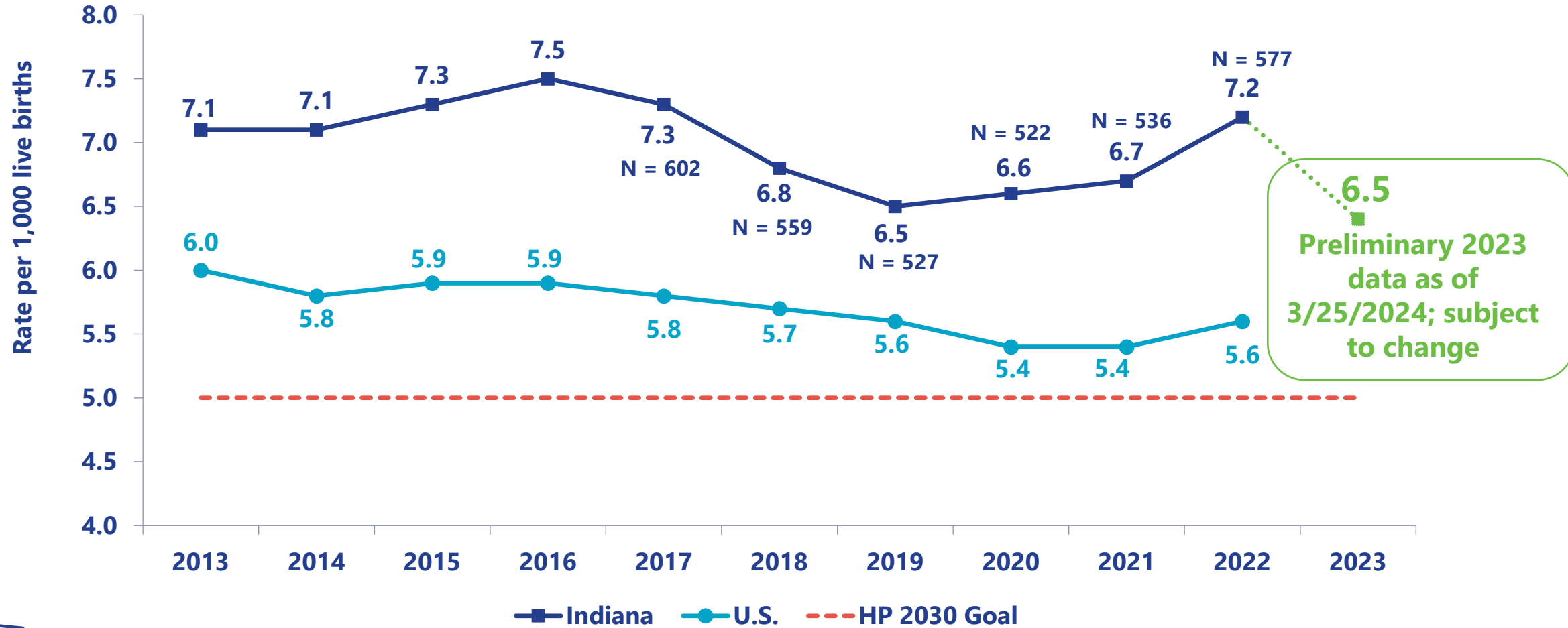
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--------------------|------|------|------|------|------|------|------|------|------|------|
| —■— Indiana | 7.1 | 7.1 | 7.3 | 7.5 | 7.3 | 6.8 | 6.5 | 6.6 | 6.7 | 7.2 |
| —●— U.S. | 6.0 | 5.8 | 5.9 | 5.9 | 5.8 | 5.7 | 5.6 | 5.4 | 5.4 | 5.6 |
| - - - HP 2030 Goal | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |



Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
 United States Original Source: Centers for Disease Control and Prevention National Center for Health Statistics
 Indiana Original Source: Indiana Department of Health, Vital Records, ODA, DAT

Infant mortality rates (IMRs)

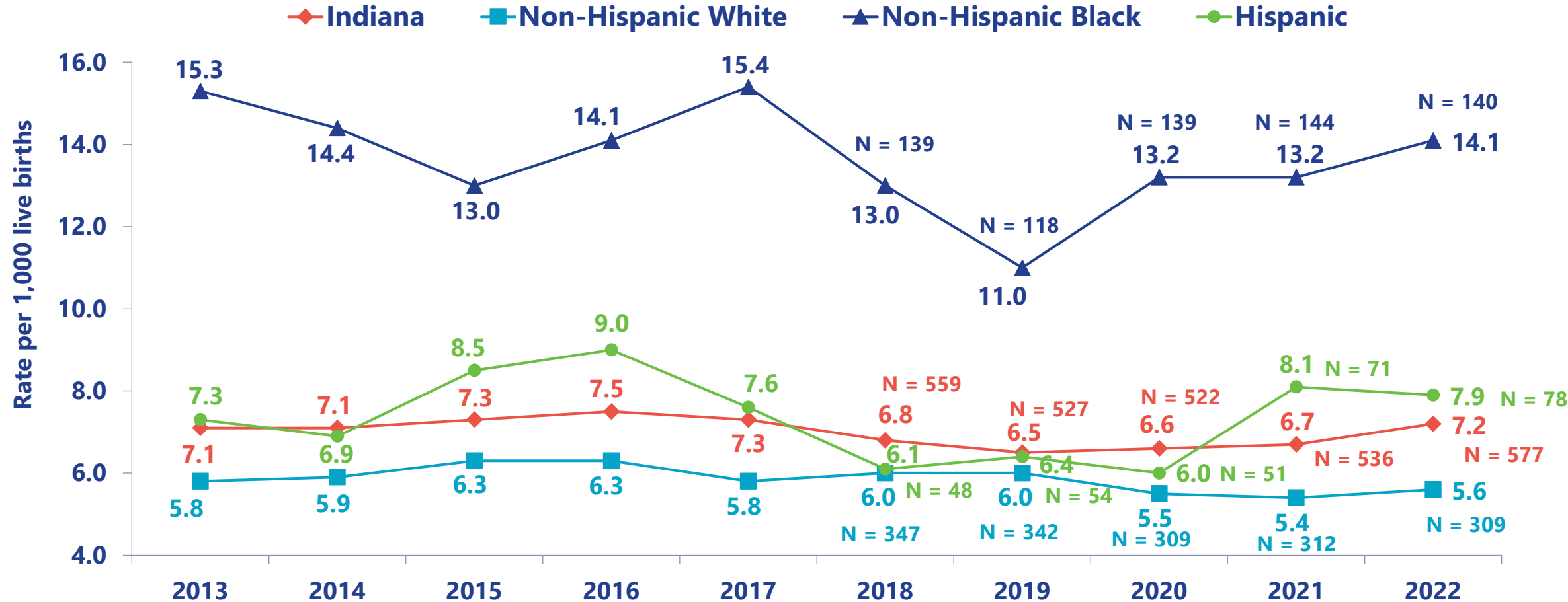
2013-Preliminary 2023



Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 25, 2024]
 United States Original Source: Centers for Disease Control and Prevention National Center for Health Statistics
 Indiana Original Source: Indiana Department of Health, Vital Records, ODA

Indiana IMRs by race and ethnicity

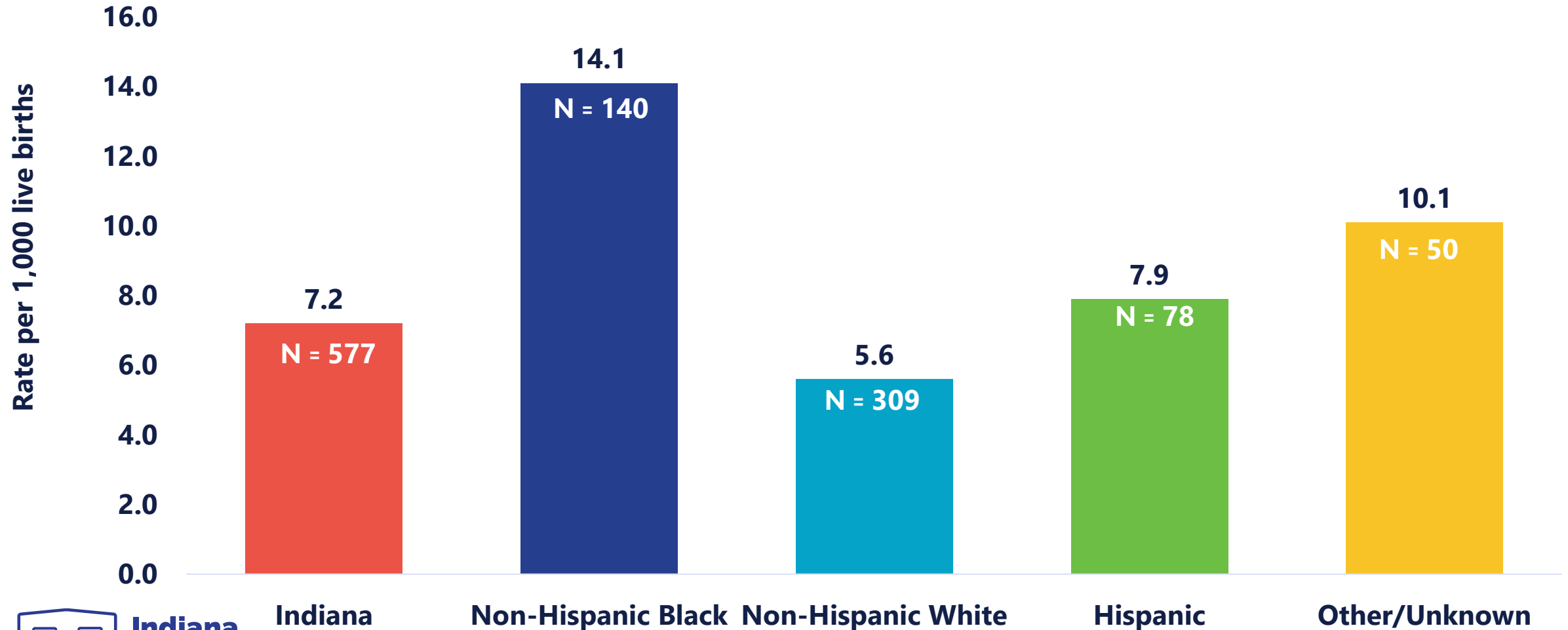
2013-2022



Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
 Indiana Original Source: Indiana Department of Health, Vital Records, ODA, DAT

Infant mortality by race and ethnicity

2022



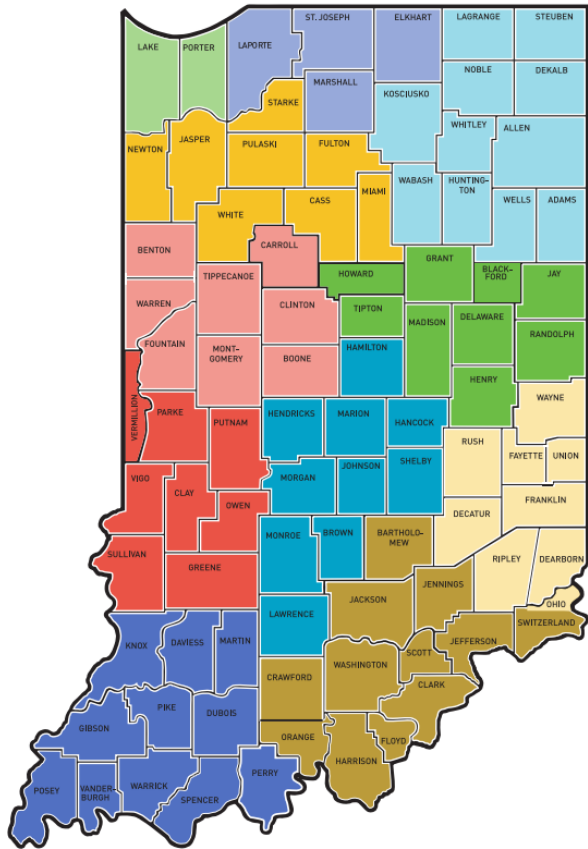
Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

Infant mortality by geography



Infant mortality by Indiana hospital region

2018-2022



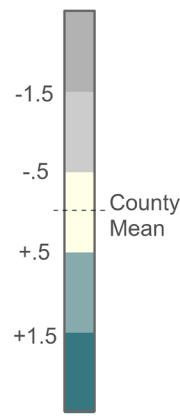
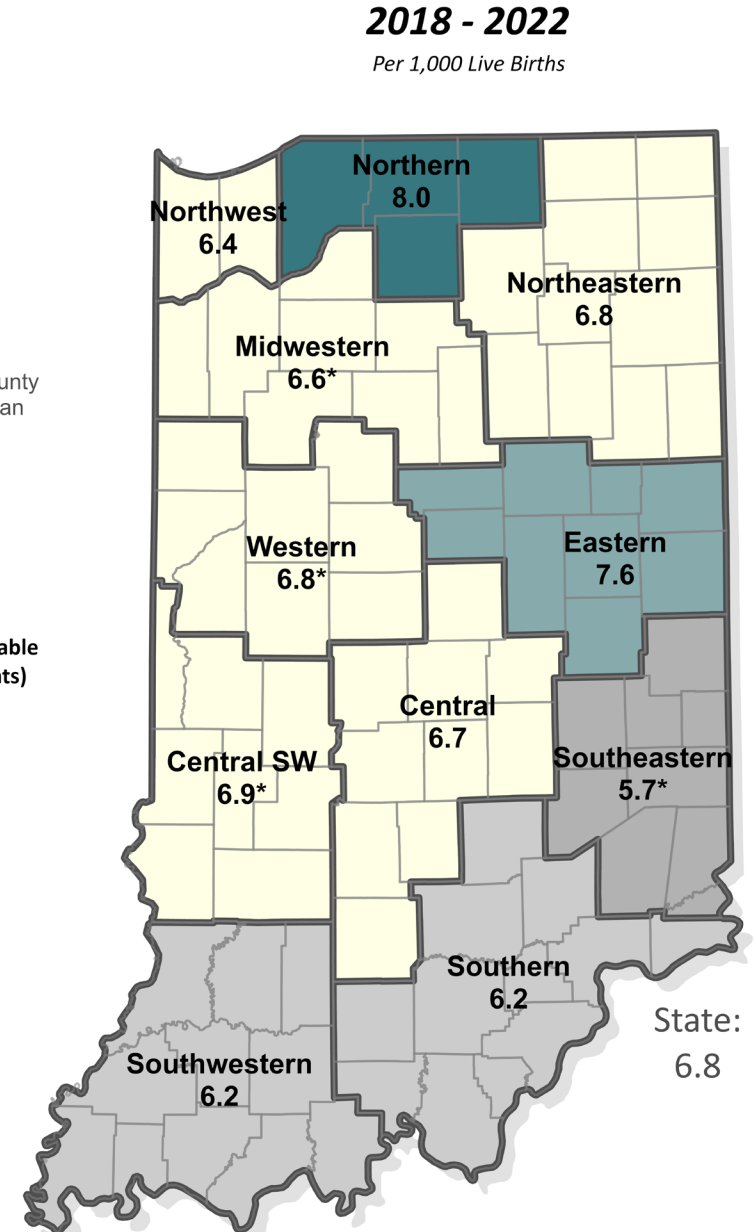
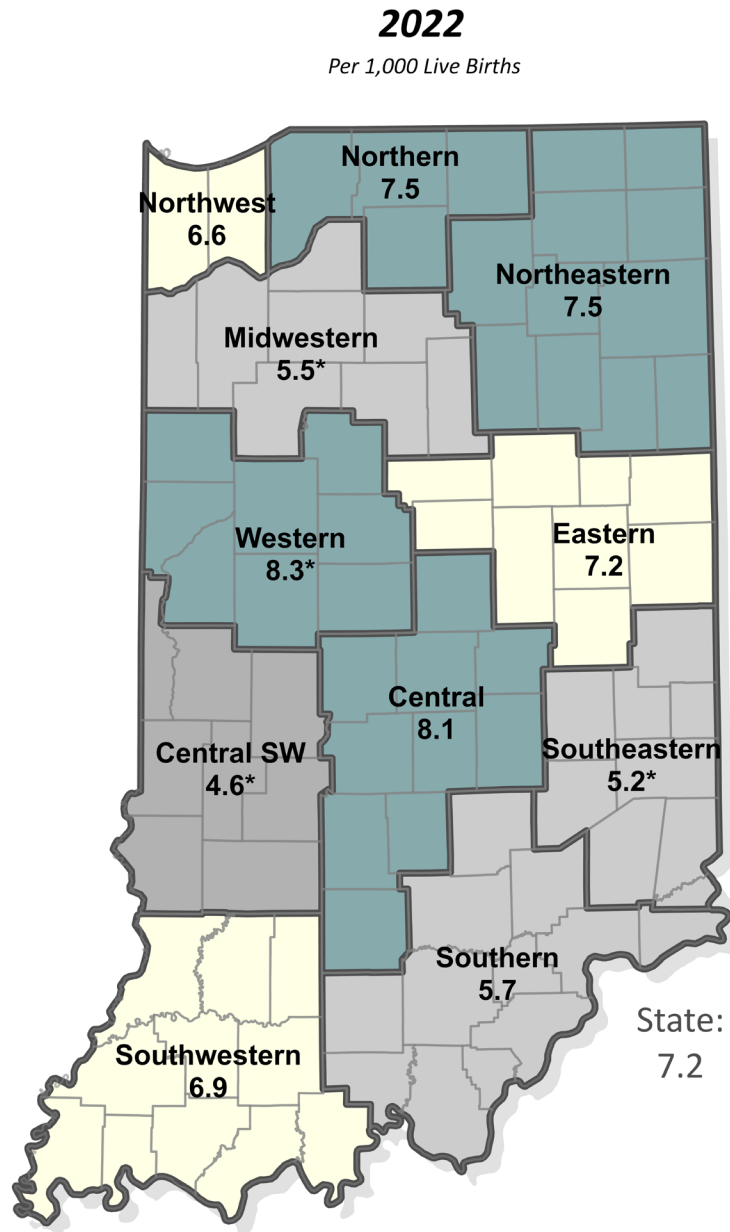
| Region | Total | Non-Hispanic White | Non-Hispanic Black | Hispanic |
|----------------------|-------|--------------------|--------------------|---------------|
| Central | 6.7 | 5.2 (N = 393) | 11.1 (N = 298) | 6.1 (N = 92) |
| Central Southwestern | 6.9 | 6.4 (N = 87) | 13.3* (N = 7) | ** (N<5) |
| Eastern | 7.6 | 6.9 (N = 159) | 15.1 (N = 36) | 6.1* (N = 8) |
| Midwestern | 6.6 | 6.3 (N = 59) | ** (N<5) | 7.5* (N = 11) |
| Northeastern | 6.8 | 5.9 (N = 245) | 16.0 (N = 68) | 8.1 (N = 35) |
| Northern | 8.0 | 6.1 (N = 162) | 18.1 (N = 97) | 7.6 (N = 54) |
| Northwest | 6.4 | 4.4 (N = 81) | 11.3 (N = 94) | 6.6 (N = 49) |
| Southeastern | 5.7 | 6.1 (N = 73) | ** (N<5) | ** (N<5) |
| Southern | 6.2 | 6.0 (N = 142) | 15.4* (N = 19) | 8.0* (N = 19) |
| Southwest | 6.2 | 5.3 (N = 122) | 16.6 (N = 31) | 5.5* (N = 8) |
| Western | 6.8 | 5.7 (N = 96) | 16.9 (N = 25) | 10.0 (N = 23) |

*Rates based on counts less than 20 are considered unstable and should be interpreted with caution.

**Rates based on counts less than 5 have been suppressed.

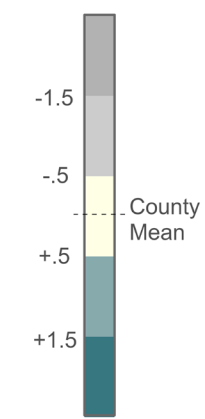
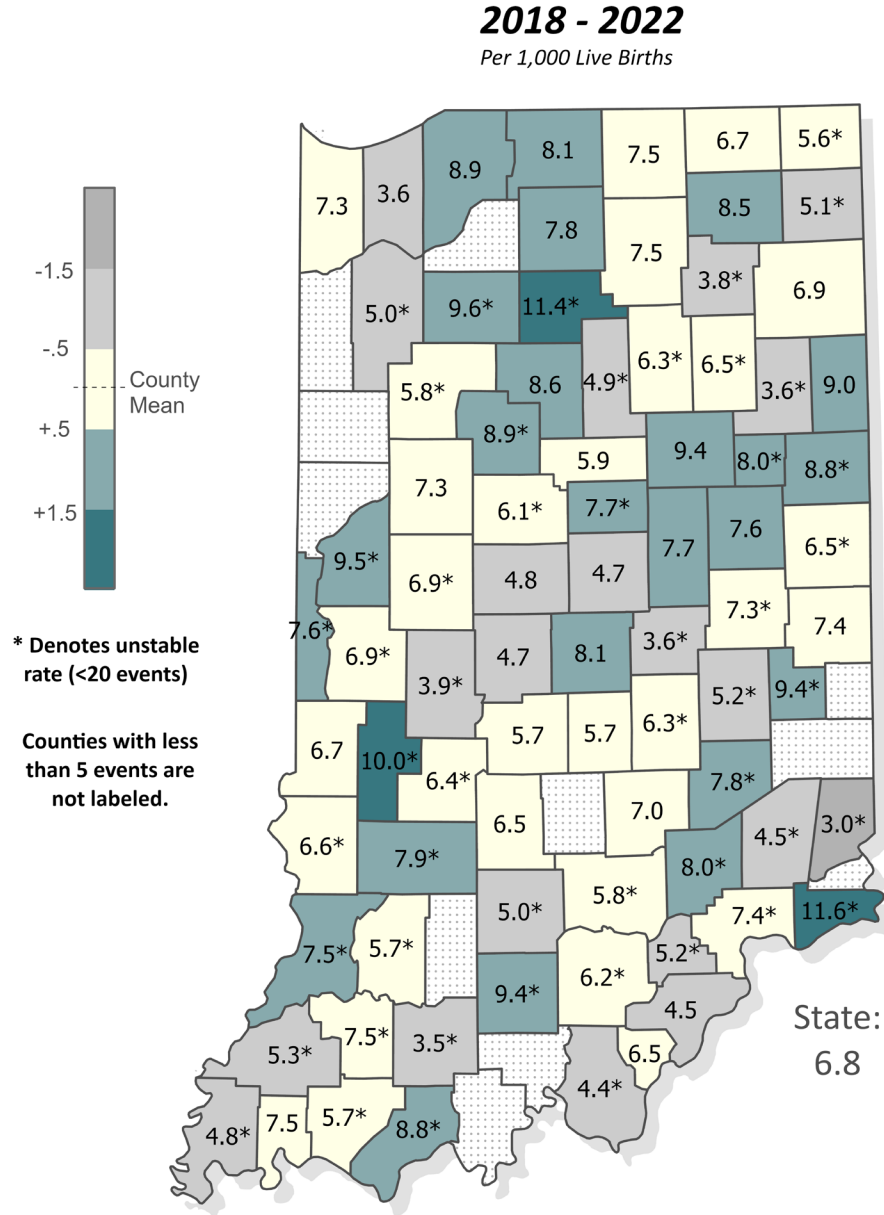
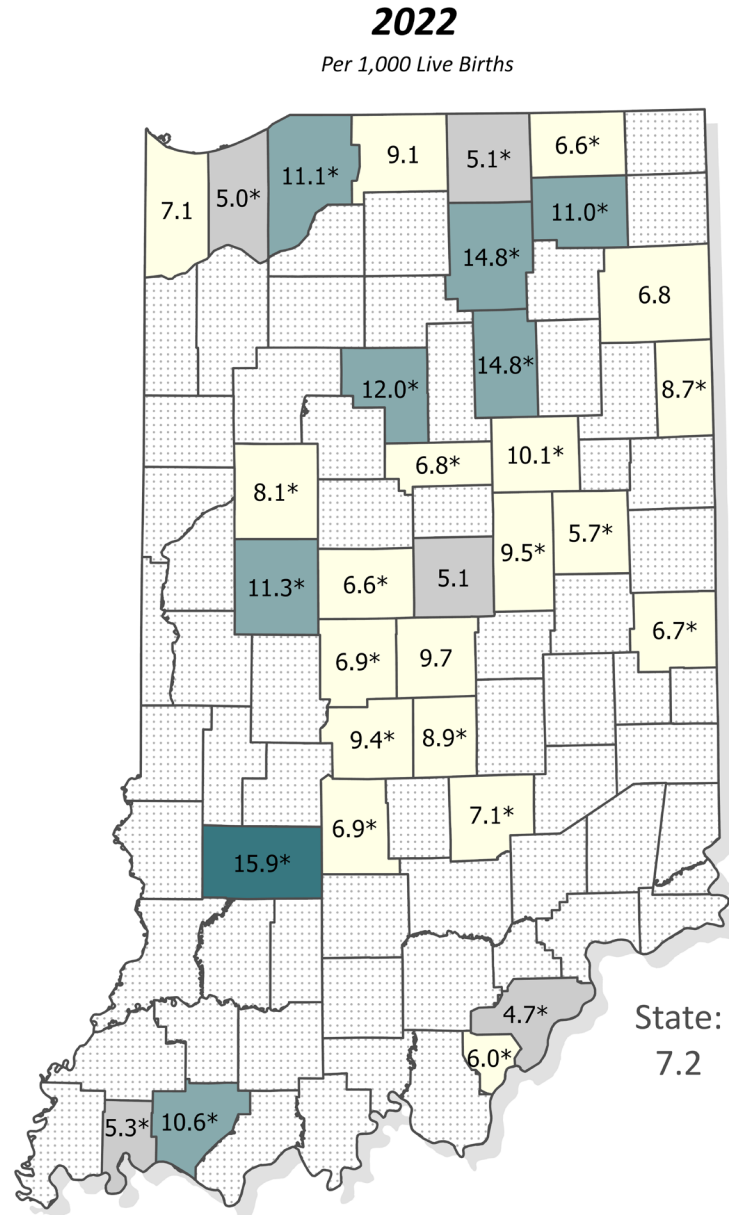


Infant Mortality by Region



* Denotes unstable rate (<20 events)

Infant Mortality by County



* Denotes unstable rate (<20 events)
Counties with less than 5 events are not labeled.

County-level Indiana infant mortality rates 2018 – 2022, stable rates

10 highest stable infant mortality rates

Grant, 9.4
Adams, 9.0
LaPorte, 8.9
Cass, 8.6
Noble, 8.5
St. Joseph, 8.1
Marion, 8.1
Marshall, 7.8
Madison, 7.7
Delaware, 7.6

Stable rates achieving Healthy People

2030 Goal (IMR<5.0)

Porter, 3.6
Clark, 4.5
Hamilton, 4.7
Hendricks, 4.7
Boone, 4.8



**Infant Mortality Rates (IMRs) are per 1,000 live births.
Stable rates are based on counts of at least 20.**

Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

County-level Indiana infant mortality rates 2018-2022, Unstable Rates

Top 10 unstable infant mortality rates*

Switzerland, 11.6

Fulton, 11.4

Clay, 10.0

Pulaski, 9.6

Fountain, 9.5

Fayette, 9.4

Orange, 9.4

Carroll, 8.9

Jay, 8.8

Spencer, 8.8

Unstable rates* achieving Healthy People 2030 Goal (IMR<5.0)

Dearborn, 3.0

Dubois, 3.5

Wells, 3.6

Hancock, 3.6

Whitley, 3.8

Putnam, 3.9

Harrison, 4.4

Ripley, 4.5

Posey, 4.8

Miami, 4.9

County Infant Mortality Rates Compared to the State 2018 - 2022

Per 1,000 Live Births



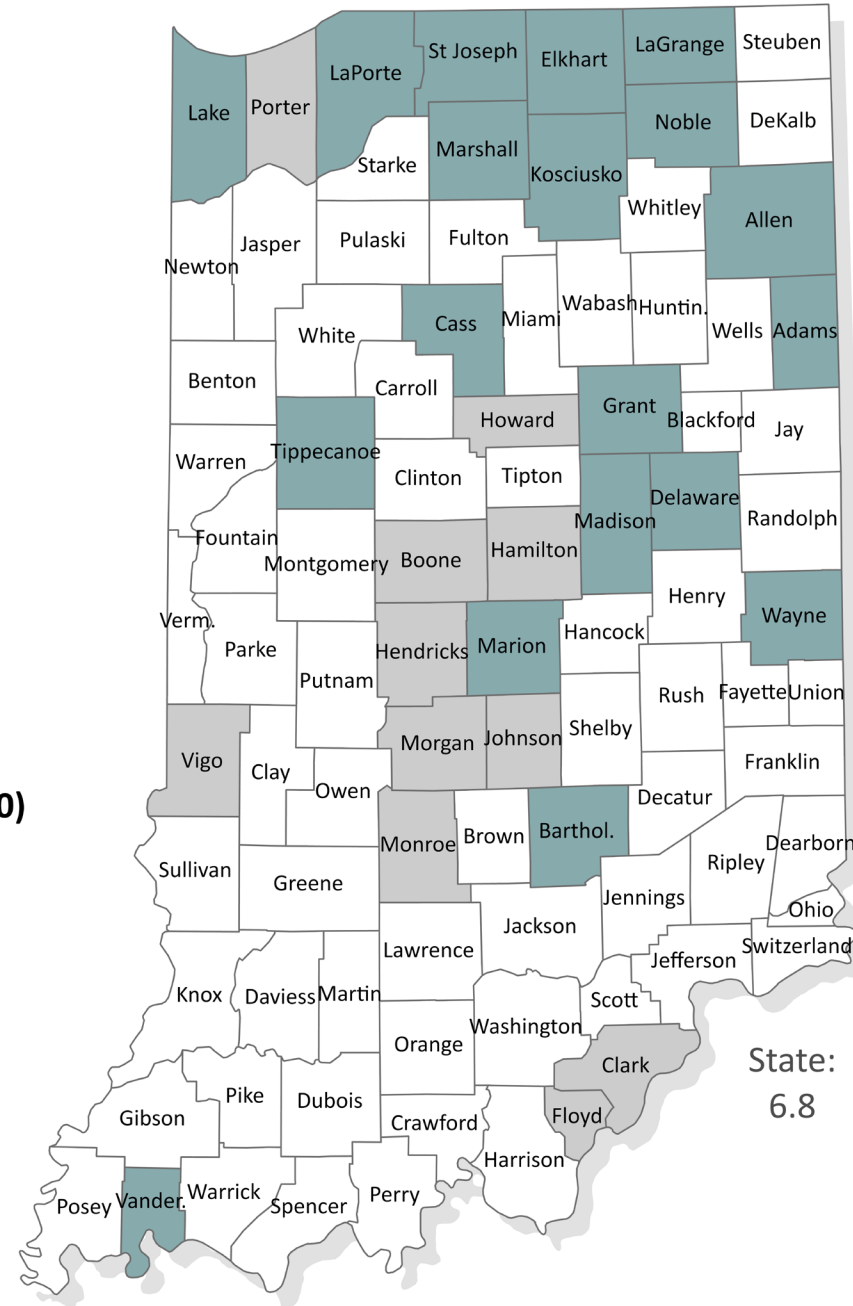
Only counties with stable rates are marked 'High' or 'Low' (>=20 events between 2018-2022).

Highest Stable Infant Mortality Rates

| | |
|--------------|-----------------|
| Grant, 9.4 | St. Joseph, 8.1 |
| Adams, 9.0 | Marion, 8.1 |
| LaPorte, 8.9 | Marshall, 7.8 |
| Cass, 8.6 | Madison, 7.7 |
| Noble, 8.5 | Delaware, 7.6 |

Stable Rates Achieving Healthy People 2030 Goal (IMR<5.0)

| |
|----------------|
| Porter, 3.6 |
| Clark, 4.5 |
| Hendricks, 4.7 |
| Hamilton, 4.7 |
| Boone, 4.8 |



County-level rates by race/ethnicity

2018 – 2022

Stable non-Hispanic Black infant mortality rates

LaPorte, 23.0

Elkhart, 22.1

Vanderburgh, 17.4

Tippecanoe, 17.0

Allen, 15.9

St. Joseph, 15.5

Lake, 11.5

Marion, 11.4

Stable Hispanic infant mortality rates

Elkhart, 8.5

Allen, 7.9

Lake, 7.1

Marion, 6.4

Stable non-Hispanic White infant mortality rates*

Adams, 9.7

Noble, 8.4

Grant, 8.3

Wayne, 7.8

Kosciusko, 7.4

Madison, 6.9



Stable rates are based on counts of at least 20. Infant Mortality Rates (IMRs) are per 1,000 live births. *Rates only included if above the 6.8 state 2018-2022 IMR.

Highest infant mortality rates by ZIP code

2018-2022

| ZIP Code | County | Births | Deaths | IMR | NH White IMR | NH Black IMR | Hispanic IMR |
|----------|------------|--------|--------|------|--------------|--------------|--------------|
| 46241 | Marion | 2,532 | 40 | 15.8 | 13.3* | 22.5* | 13.6* |
| 46219 | Marion | 2,422 | 31 | 12.8 | 7.3* | 24.1* | 11.2* |
| 46516 | Elkhart | 2,730 | 33 | 12.1 | 6.6* | 34.4* | 8.9* |
| 46806 | Allen | 2,489 | 29 | 11.7 | 17.7* | 17.3* | ** |
| 46628 | St. Joseph | 1,998 | 23 | 11.5 | 7.8* | 16.1* | ** |
| 46222 | Marion | 3,078 | 35 | 11.4 | ** | 23.0 | 3.7* |
| 46410 | Lake | 2,118 | 23 | 10.9 | ** | 15.9* | ** |
| 46218 | Marion | 2,514 | 26 | 10.3 | ** | 10.8* | 13.5* |
| 46514 | Elkhart | 2,760 | 28 | 10.1 | 8.2* | 23.0* | 11.8* |
| 46360 | Laporte | 2,574 | 26 | 10.1 | 5.4* | 20.7* | ** |

*Rates based on counts less than 20 are considered unstable and should be interpreted with caution.

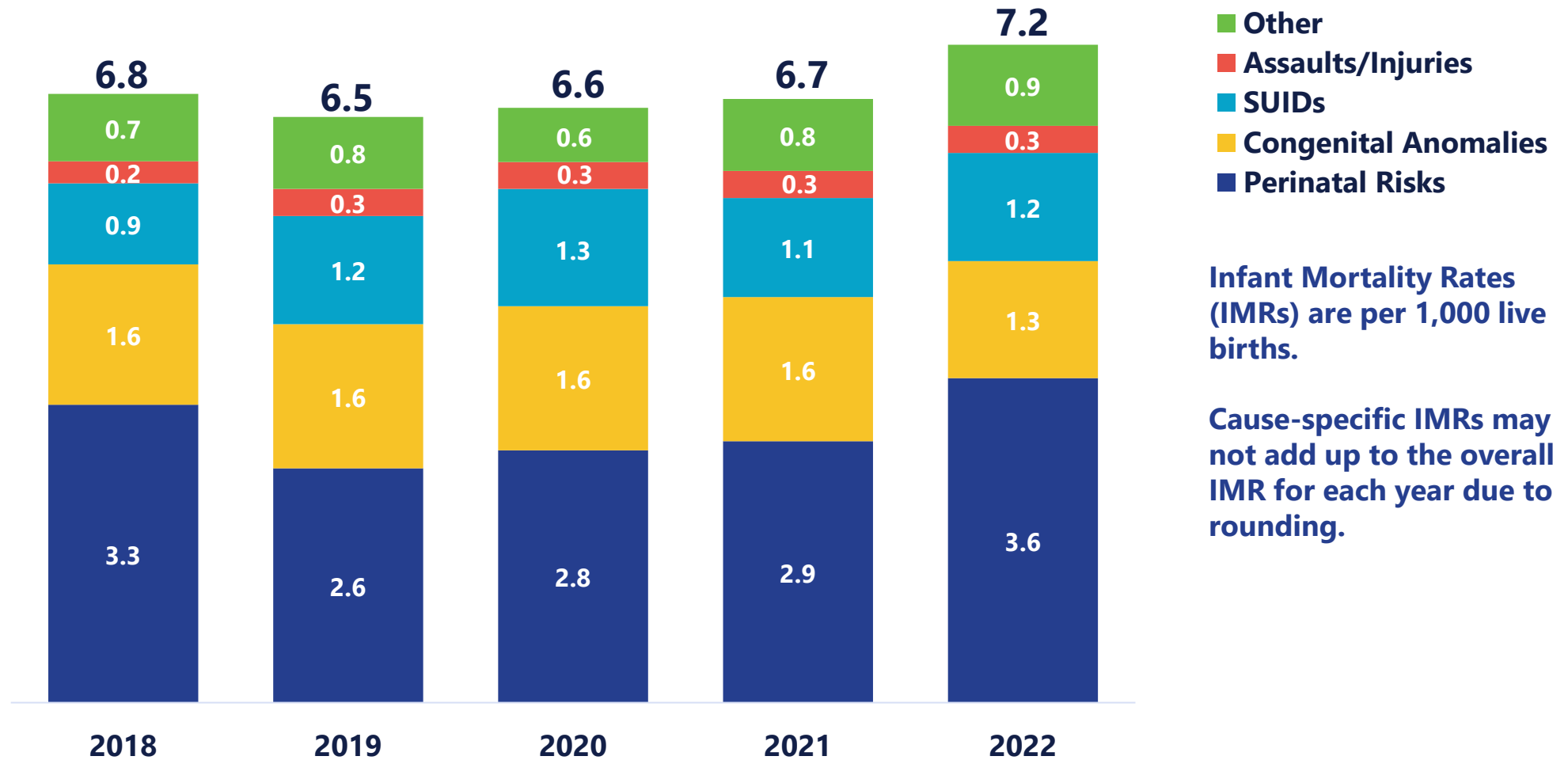
**Rates based on counts less than 5 have been suppressed.

- This table is sorted by overall infant mortality rate in descending order with Zip Code 46241 in Marion County having the highest IMR at 15.8.
- The IMRs by race and ethnicity are not listed in descending order. For example, Zip Code 46516 in Elkhart County has the highest Non-Hispanic Black IMR at 34.4*.

Cause-specific infant mortality

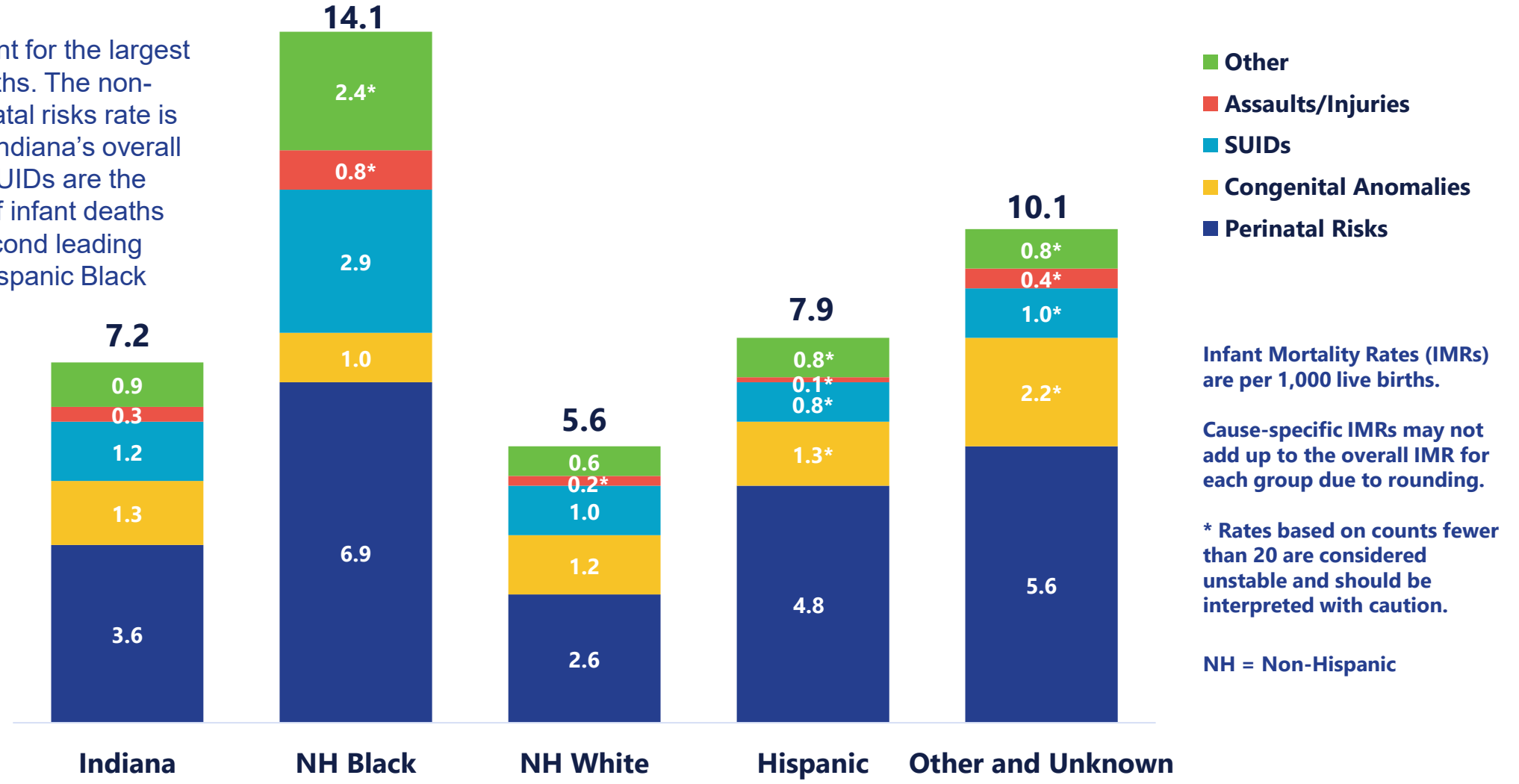


Causes of Indiana infant mortality



2022 cause-Specific IMR by race/ethnicity

Perinatal risks account for the largest number of infant deaths. The non-Hispanic Black perinatal risks rate is almost the same as Indiana's overall IMR for all causes. SUIDs are the third leading cause of infant deaths in Indiana but the second leading cause among non-Hispanic Black infants.



- Other
- Assaults/Injuries
- SUIDs
- Congenital Anomalies
- Perinatal Risks

Infant Mortality Rates (IMRs) are per 1,000 live births.

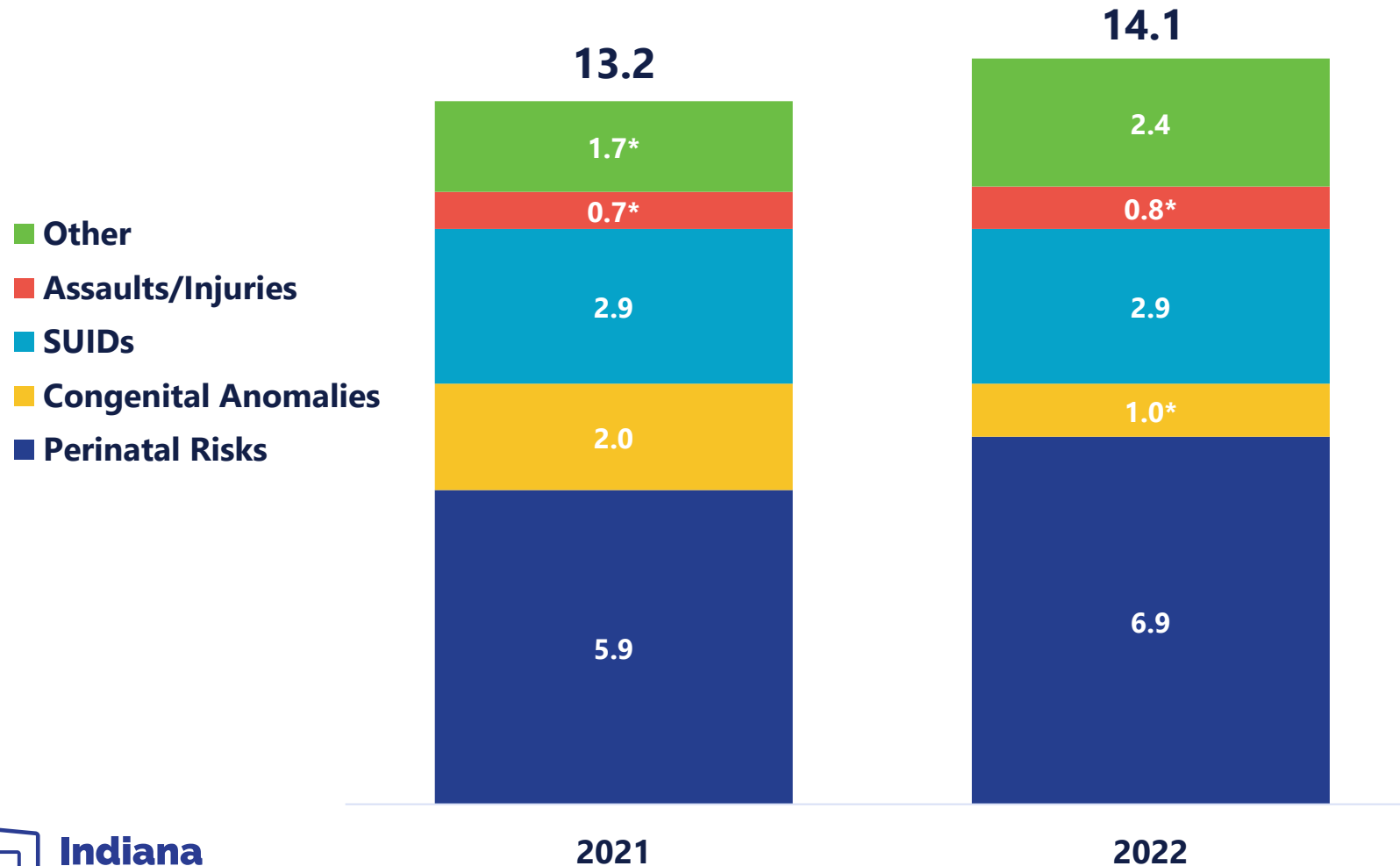
Cause-specific IMRs may not add up to the overall IMR for each group due to rounding.

* Rates based on counts fewer than 20 are considered unstable and should be interpreted with caution.

NH = Non-Hispanic



Causes of Indiana NH Black infant mortality



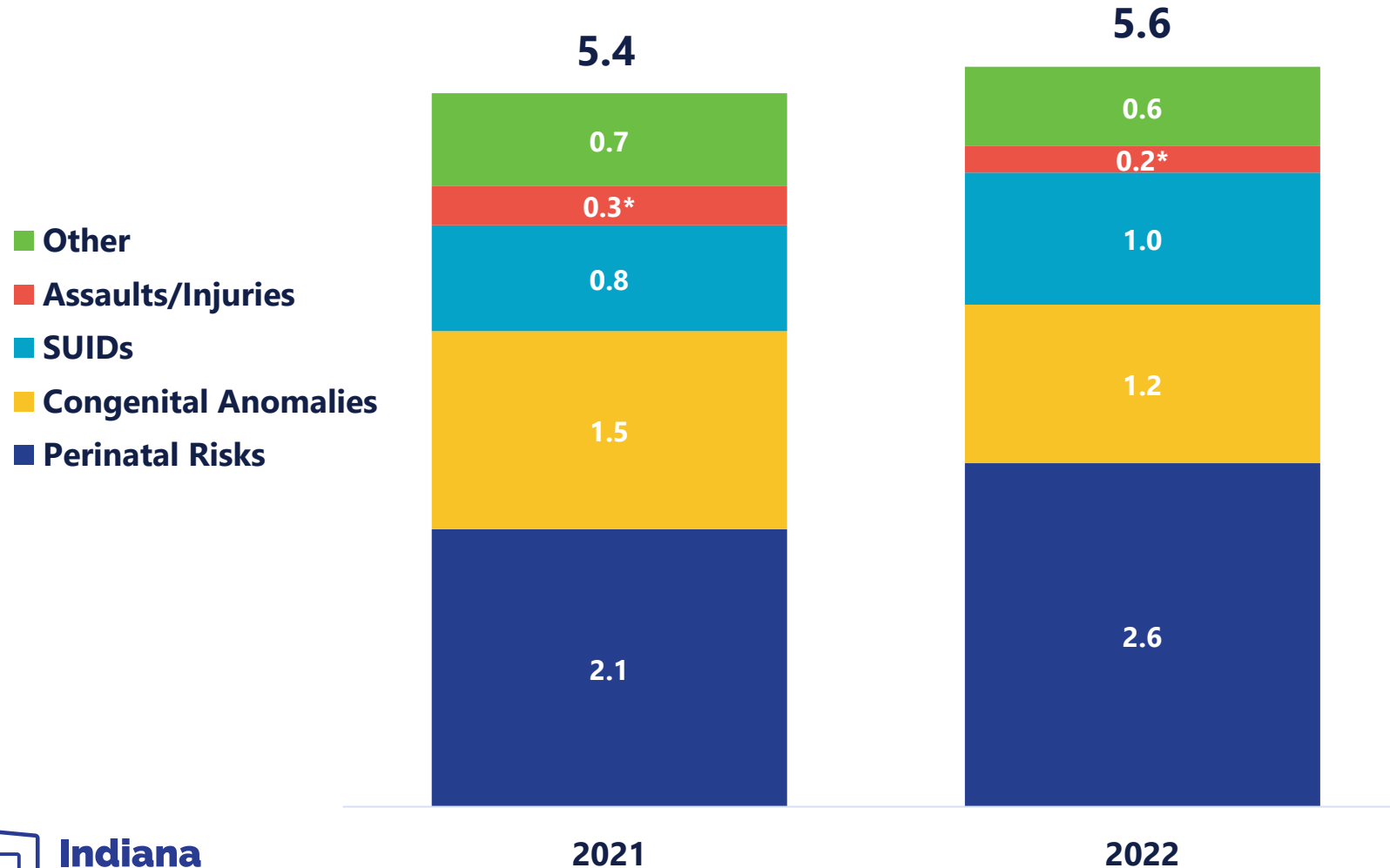
Infant Mortality Rates (IMRs) are per 1,000 live births.

Cause-specific IMRs may not add up to the overall IMR for each year due to rounding.

* Rates based on counts fewer than 20 are considered unstable and should be interpreted with caution.

NH = Non-Hispanic

Causes of Indiana non-Hispanic White infant mortality



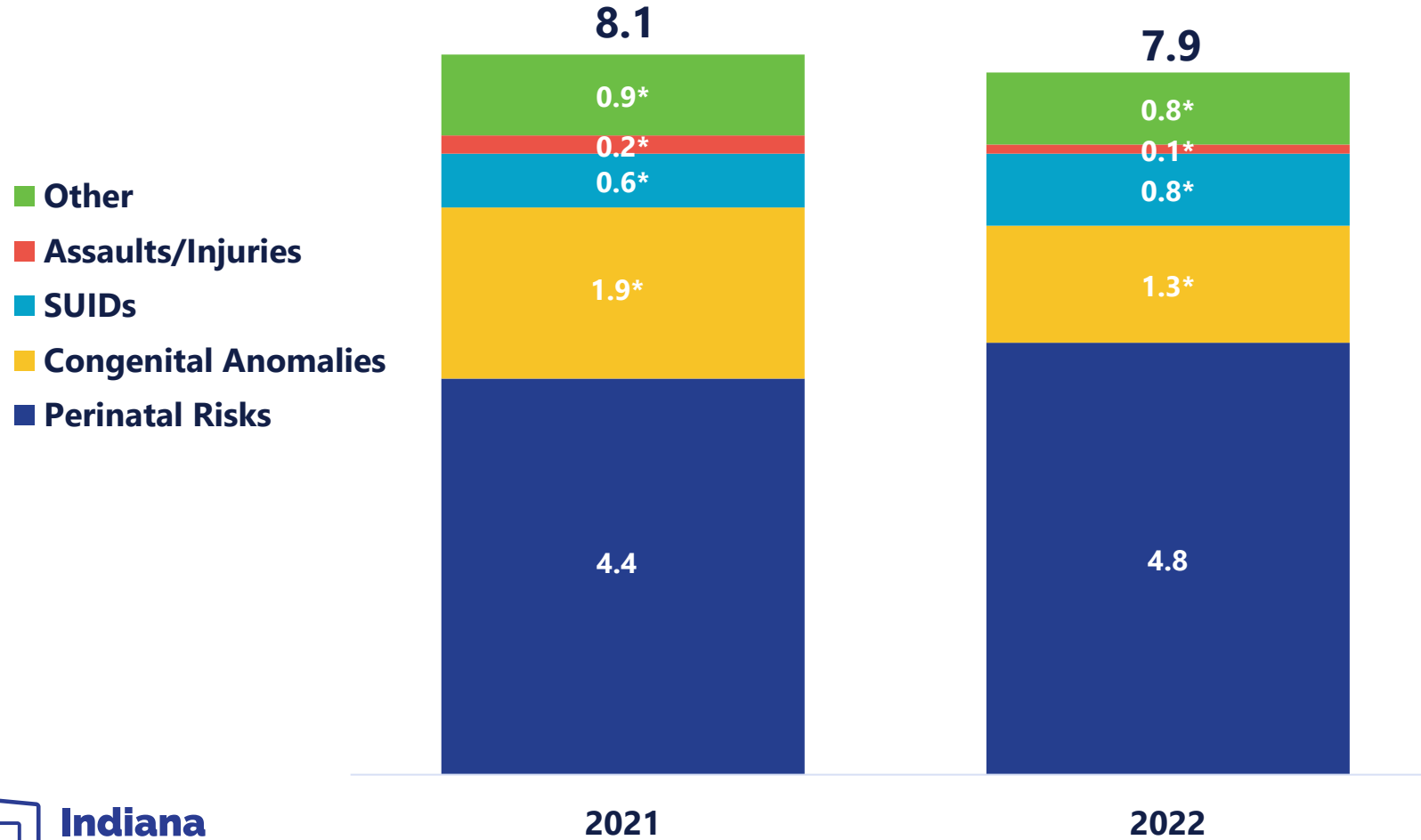
Infant Mortality Rates (IMRs) are per 1,000 live births.

Cause-specific IMRs may not add up to the overall IMR for each year due to rounding.

* Rates based on counts fewer than 20 are considered unstable and should be interpreted with caution.

NH = Non-Hispanic

Causes of Indiana Hispanic infant mortality



Infant Mortality Rates (IMRs) are per 1,000 live births.

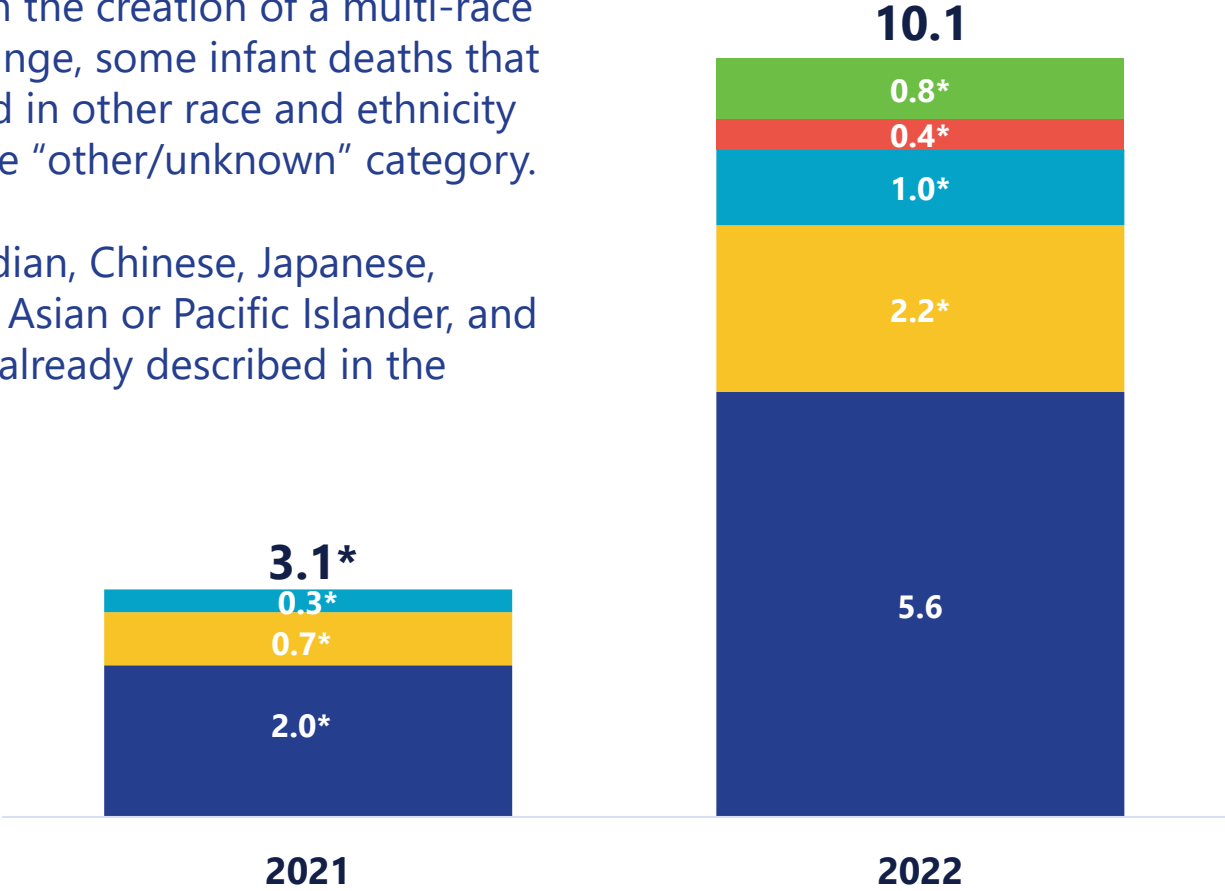
Cause-specific IMRs may not add up to the overall IMR for each year due to rounding.

* Rates based on counts fewer than 20 are considered unstable and should be interpreted with caution.

Causes of Indiana other/unknown race infant mortality

There has been a change in the NCHS classification of race, which resulted in the creation of a multi-race variable. Due to that change, some infant deaths that were previously reported in other race and ethnicity categories are now in the "other/unknown" category.

"Other" also includes Indian, Chinese, Japanese, Hawaiian, Filipino, other Asian or Pacific Islander, and other races that are not already described in the categories listed.



Infant Mortality Rates (IMRs) are per 1,000 live births.

Cause-specific IMRs may not add up to the overall IMR for each year due to rounding.

* Rates based on counts less than 20 are considered unstable and should be interpreted with caution.

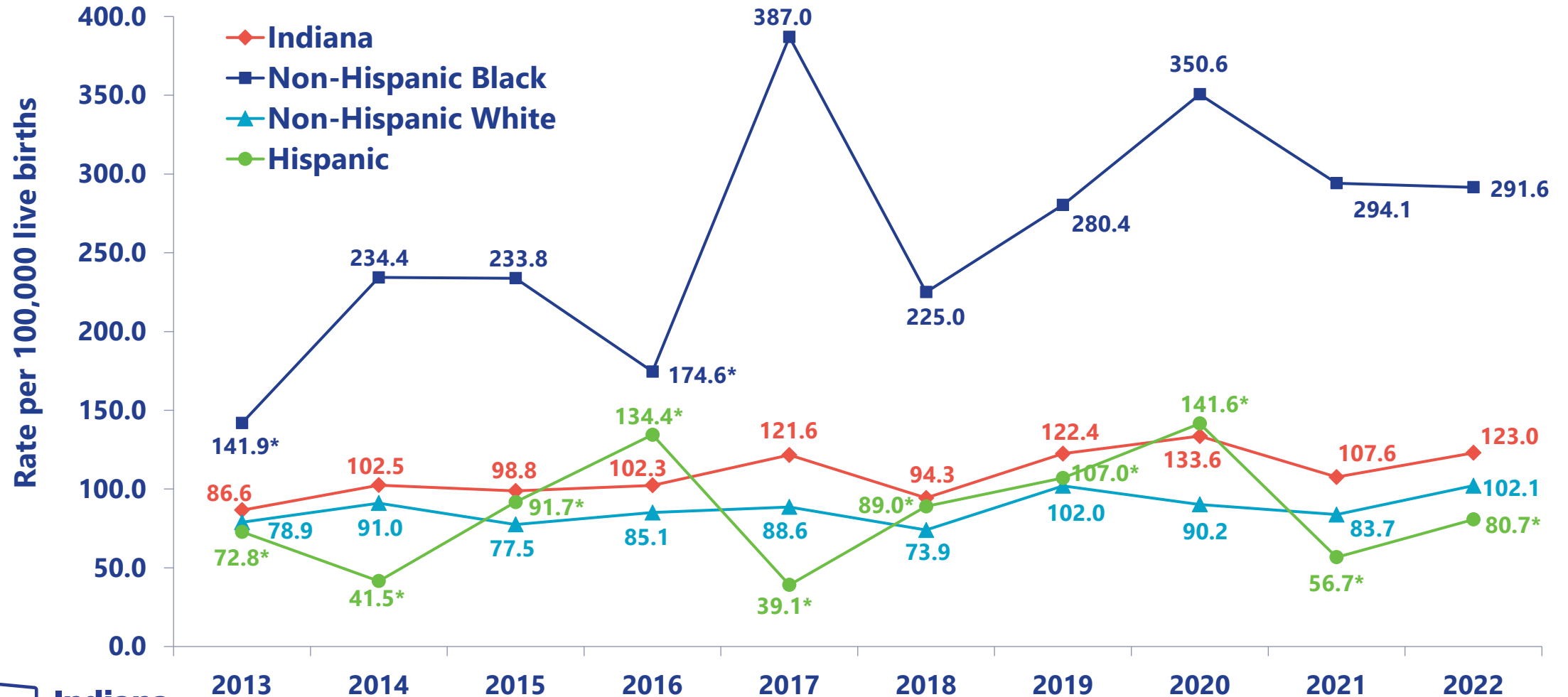
- Other
- Assaults/Injuries
- SUIDs
- Congenital Anomalies
- Perinatal Risks



Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

SUIDs rates by race and ethnicity

Indiana, 2013-2022



* Rates based on counts less than 20 are considered unstable and should be interpreted with caution.

SUIDs = W75 (Accidental Suffocation and Strangulation in Bed), R95 (Sudden Infant Death Syndrome/SIDS), R99 (Unknown)

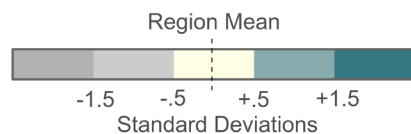
Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]

Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team



Sudden Unexpected Infant Deaths By Hospital Region 2018 - 2022

Per 100,000 Live Births



* Denotes unstable rate (<20 events)

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2024



Infant mortality by age

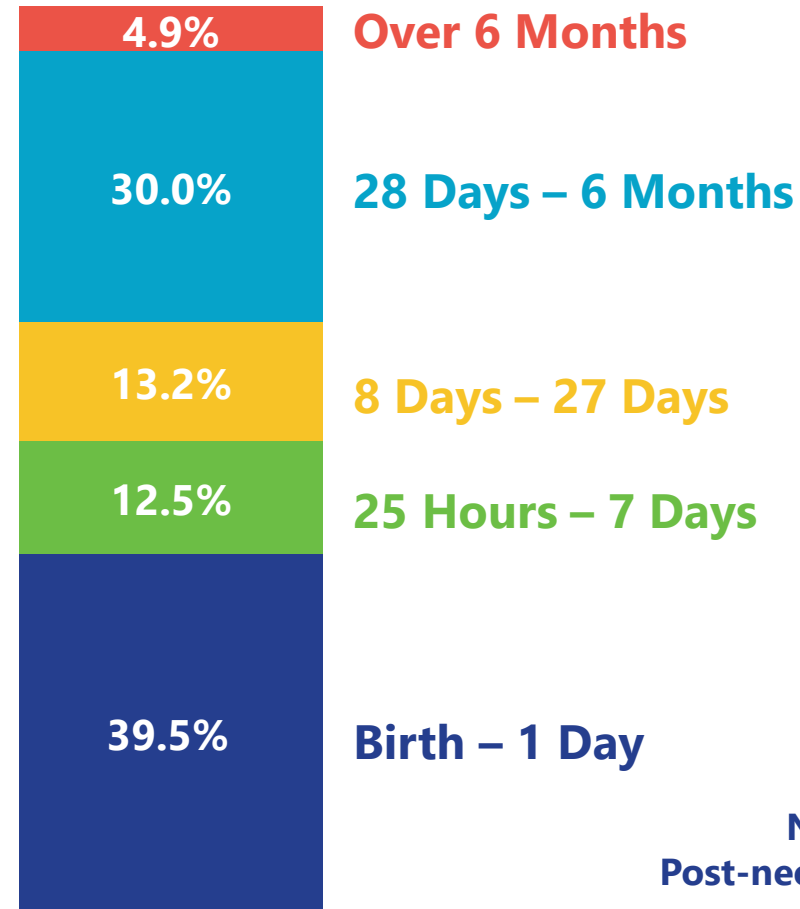


2022 infant deaths by age

N = 577
Total neonatal = 376
Total post-neonatal = 201

65.2%

of Indiana infant deaths
occurred during the
neonatal (0-27 days)
period



Neonatal = 0-27 days
Post-neonatal = 28-364 days

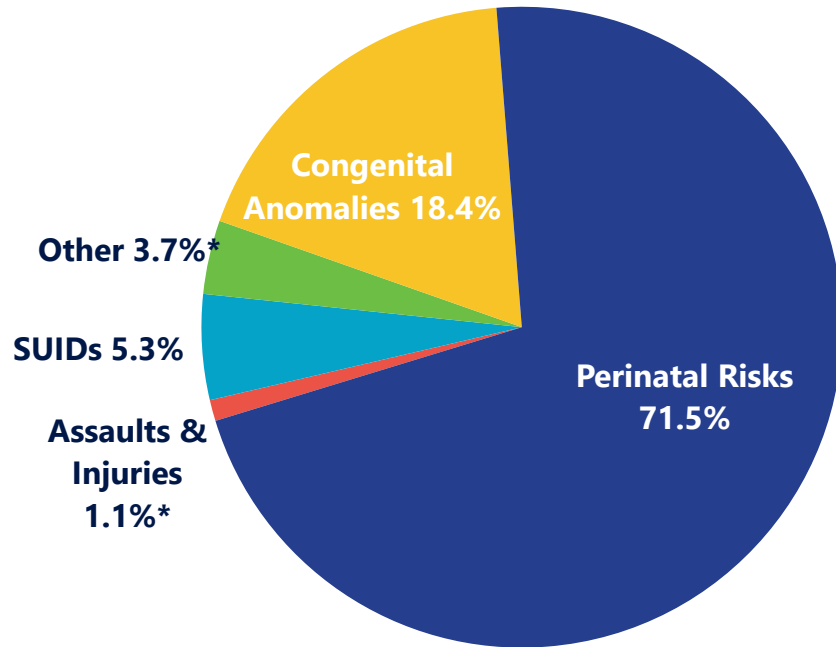
Time-specific percentages may not add up
to 100% overall due to rounding.



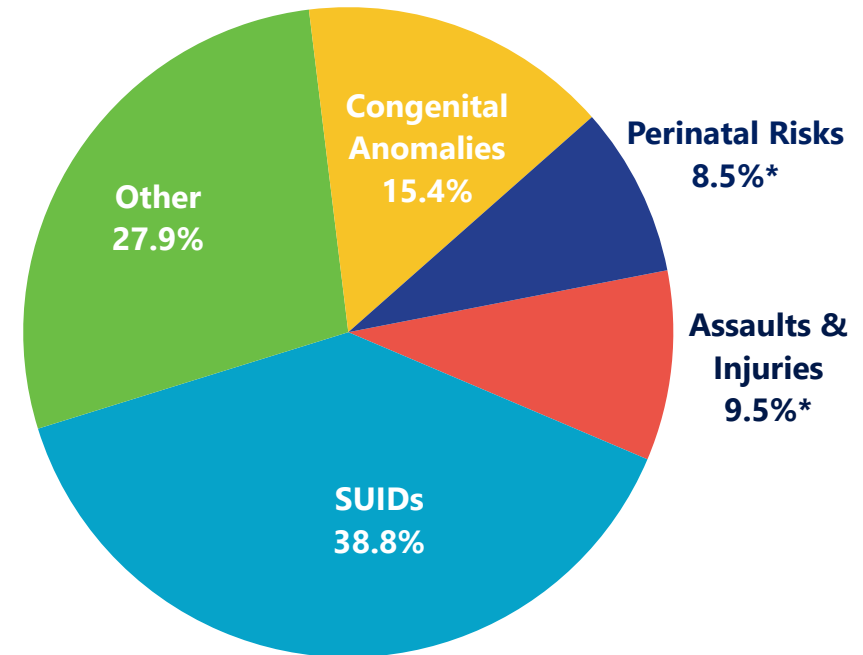
Causes of infant mortality by age

Indiana 2022

Neonatal



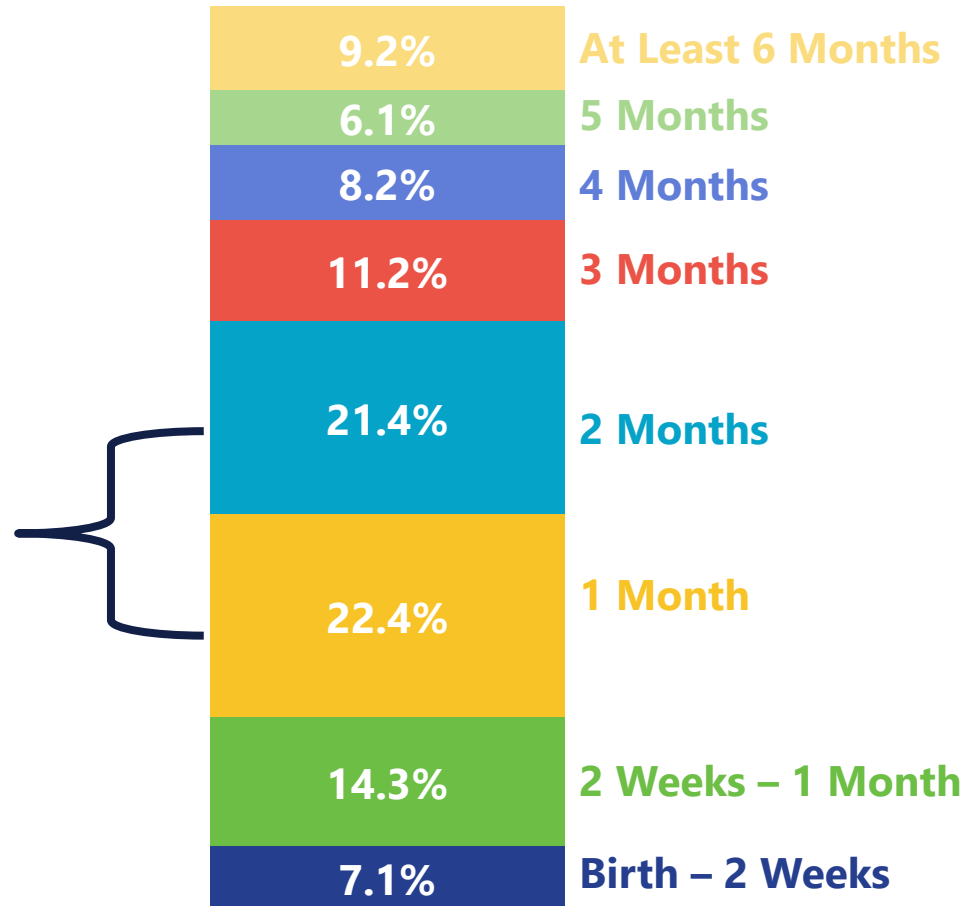
Post - neonatal



2022 SUIDs by age

Over 40%

of Indiana SUIDs occurred between the age of 1 month and 3 months



Contributing factors to infant mortality



Factors contributing to infant mortality

Indiana 2022

- **Obesity**

- Indiana ranks 12th highest in the U.S. for percentage of adults who have obesity (36.3% of adults)
- 35.6% of Indiana births in 2022 were to pregnant women who have obesity (additional 26.1% overweight)
- Pregnant women who have obesity have an increased risk of preterm birth (13.0% of Indiana births to those who have obesity were preterm compared to 9.4% of births to those in the normal BMI range)

- **Smoking**

- 6.6% of births exposed to smoking during pregnancy
- 12.2% of births to women on Medicaid were exposed to smoking during pregnancy while 2.6% of births to women not on Medicaid were exposed to smoking

- **Limited prenatal care**

- 29.1% of births were to women not receiving prenatal care during the 1st trimester (a statistically significant increase compared to 2021)

- **Unsafe sleep practices**

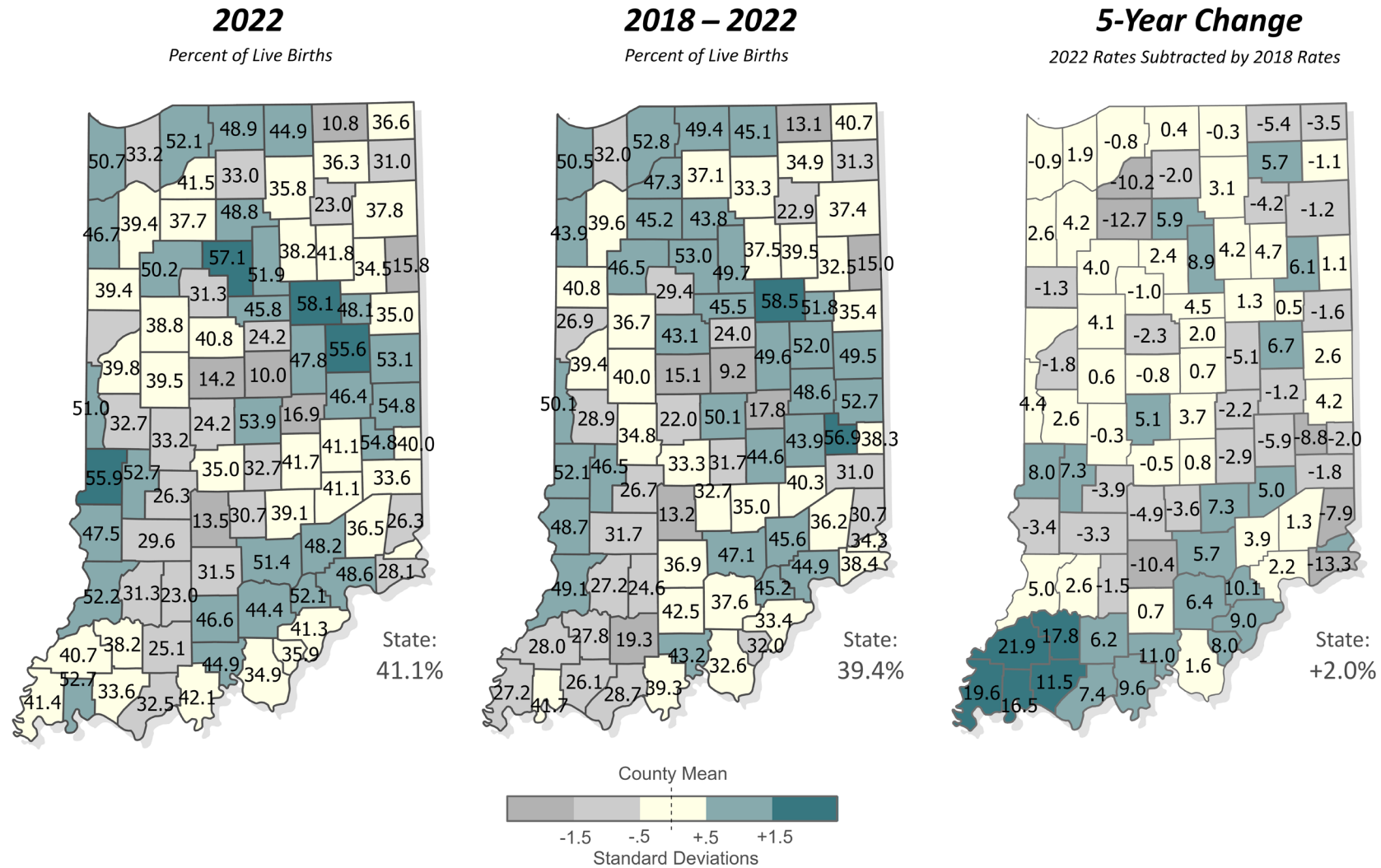
- 17.0% of infant deaths in 2022 can be attributed to SUIDs

Self-reported demographics

Indiana 2022

- **Average age** = 28 years (Range: 12 - 64)
- **Education**
 - 14.7% have less than a high school diploma
 - 29.2% have a high school diploma or GED
 - 17.2% have some college education, but no degree
 - 38.8% have an associate's degree or higher
- **Income** – 41.1% of births to mothers on Medicaid
 - Medicaid Reports – 52.1%
- **Marital Status** – 56.1% to married parents

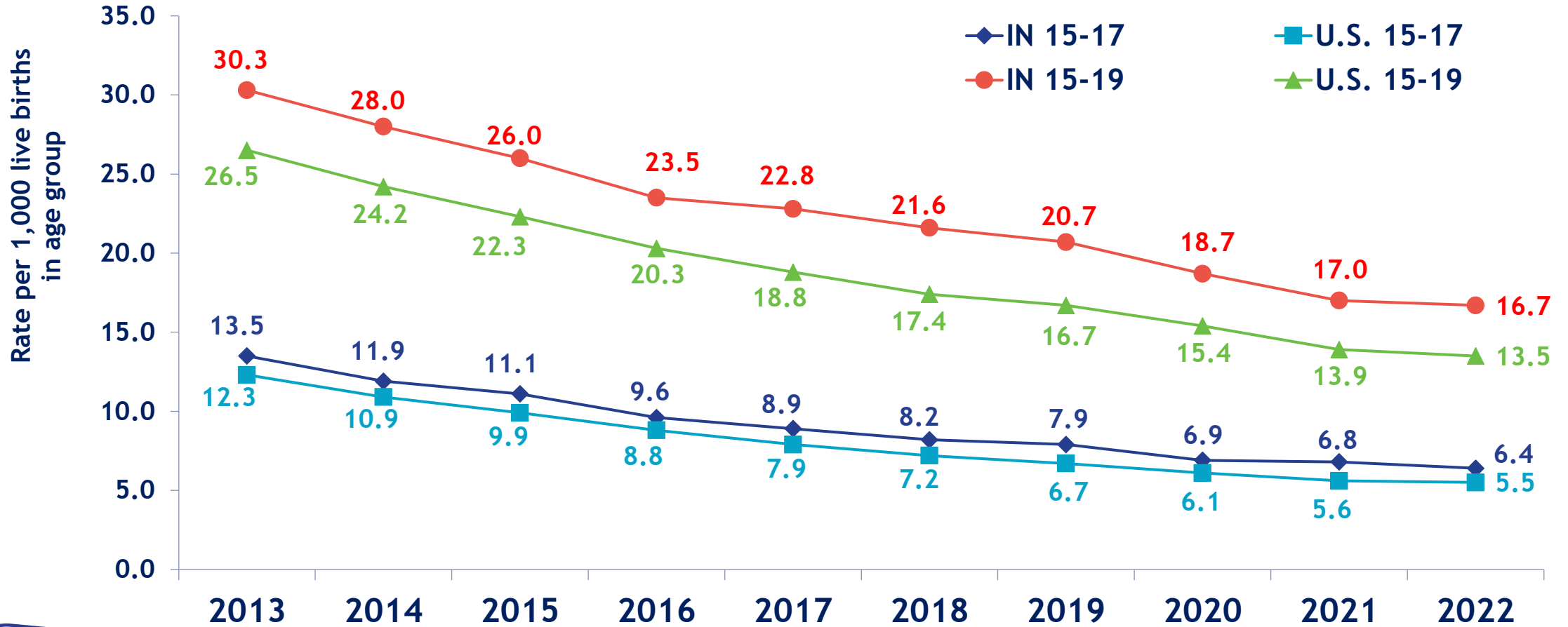
Births Covered by Medicaid



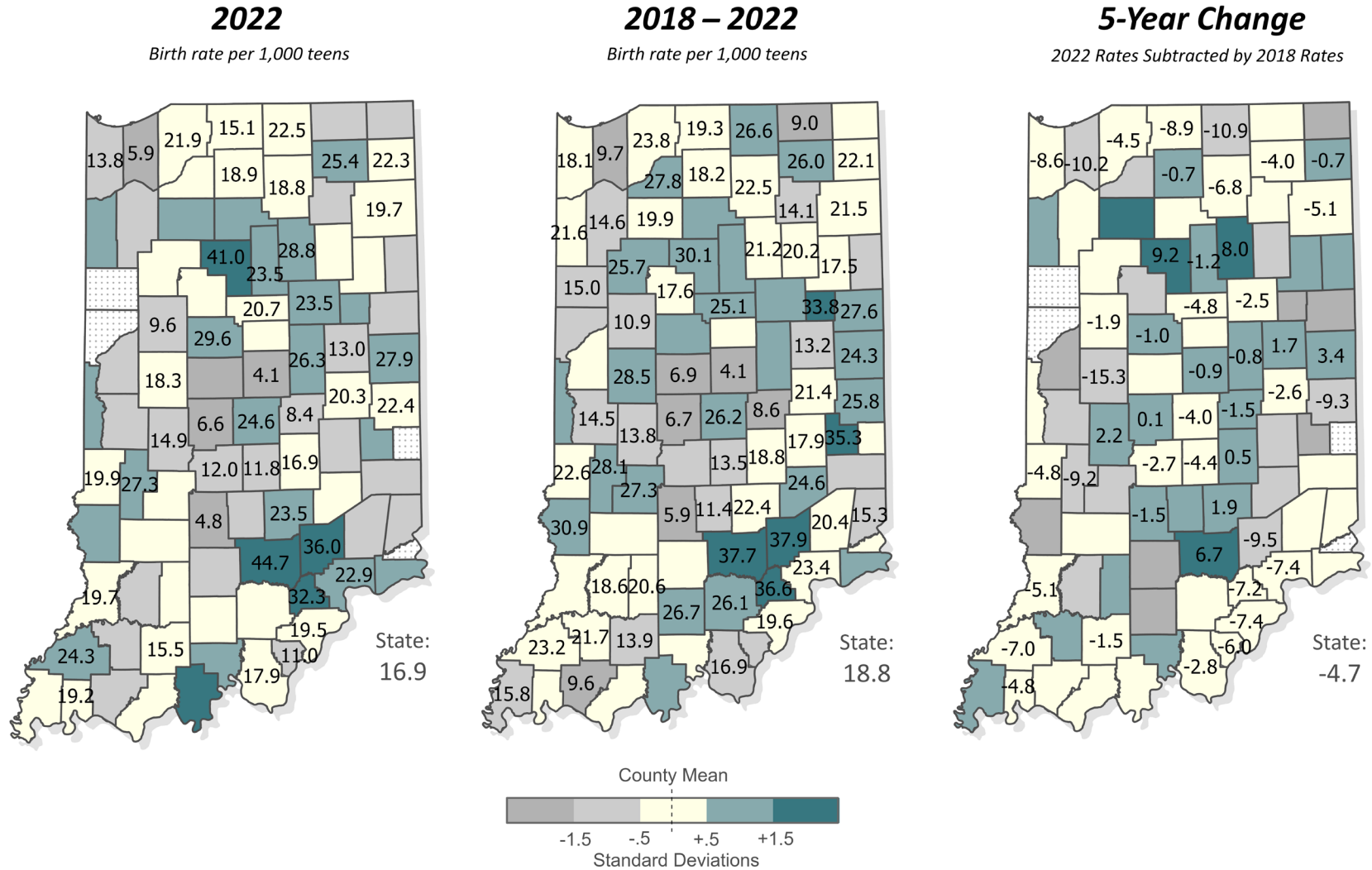
Only stable county percentages are labeled (≥ 20 events). Counties with less than 5 events are suppressed.

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2024

Age-specific birth rates for teens, Indiana and U.S., 2013-2022



Births to Teens Ages 15 to 19



Only stable county percentages are labeled (≥ 20 events). Counties with less than 5 events are suppressed.

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2024

Birth outcomes



Indiana birth outcomes

| Measure | 2020 | 2021 | 2022 |
|--|---------|---------|---------|
| Preterm (< 37 weeks gestation) | 10.4% ↑ | 10.9% ↑ | 10.9% |
| Low birthweight (< 2500 g) | 8.1% ↓ | 8.4% ↑ | 8.7% ↑ |
| Very low birthweight (< 1500 g) | 1.4% ↑ | 1.3% ↓ | 1.4% ↑ |
| No early prenatal care (first trimester) | 30.7% ↓ | 28.3% ↓ | 29.1% ↑ |
| Teen pregnancy | 5.3% ↓ | 4.9% ↓ | 4.7% ↓ |
| Breastfeeding (at discharge) | 82.0% | 81.4% ↓ | 83.9% ↑ |



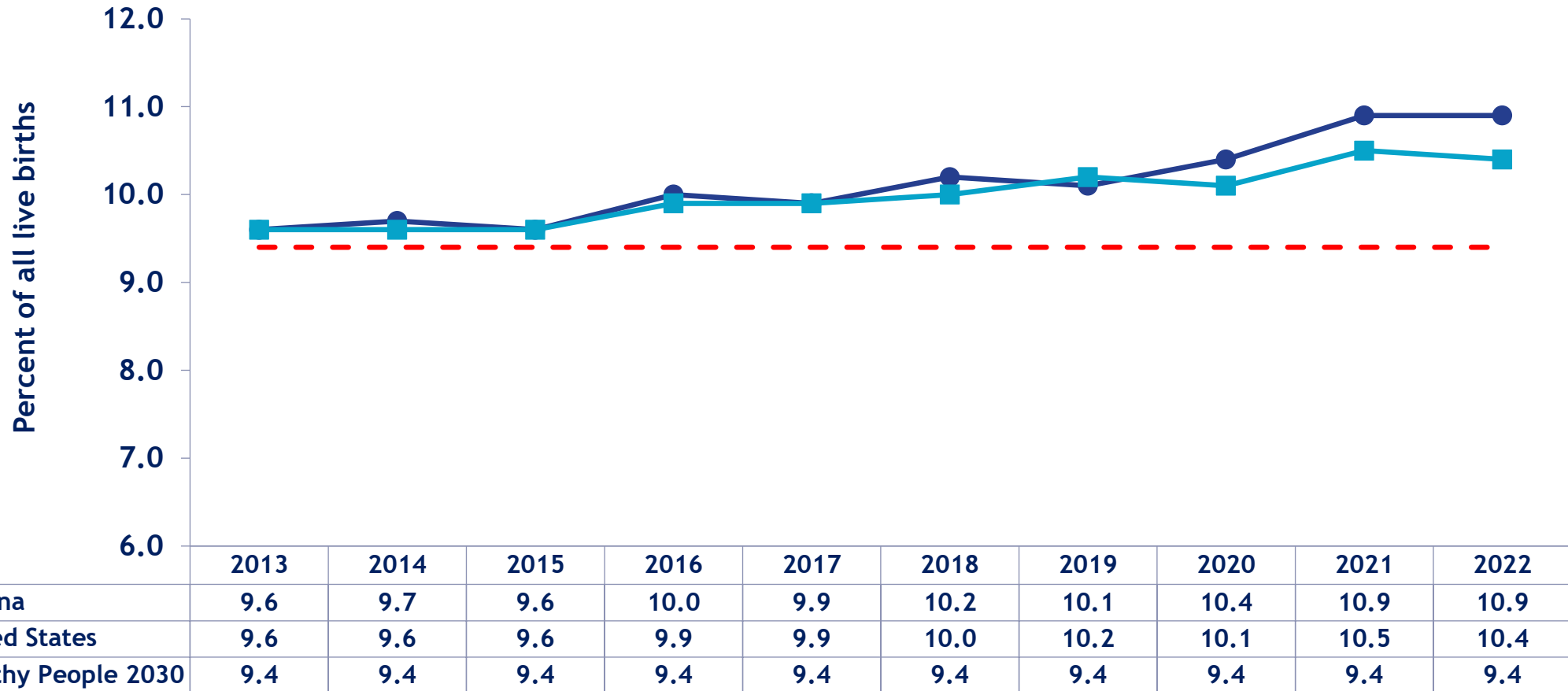
Percentages are significantly different than the previous year at 0.05 level.

Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
 Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

2022 birth outcomes by race and ethnicity

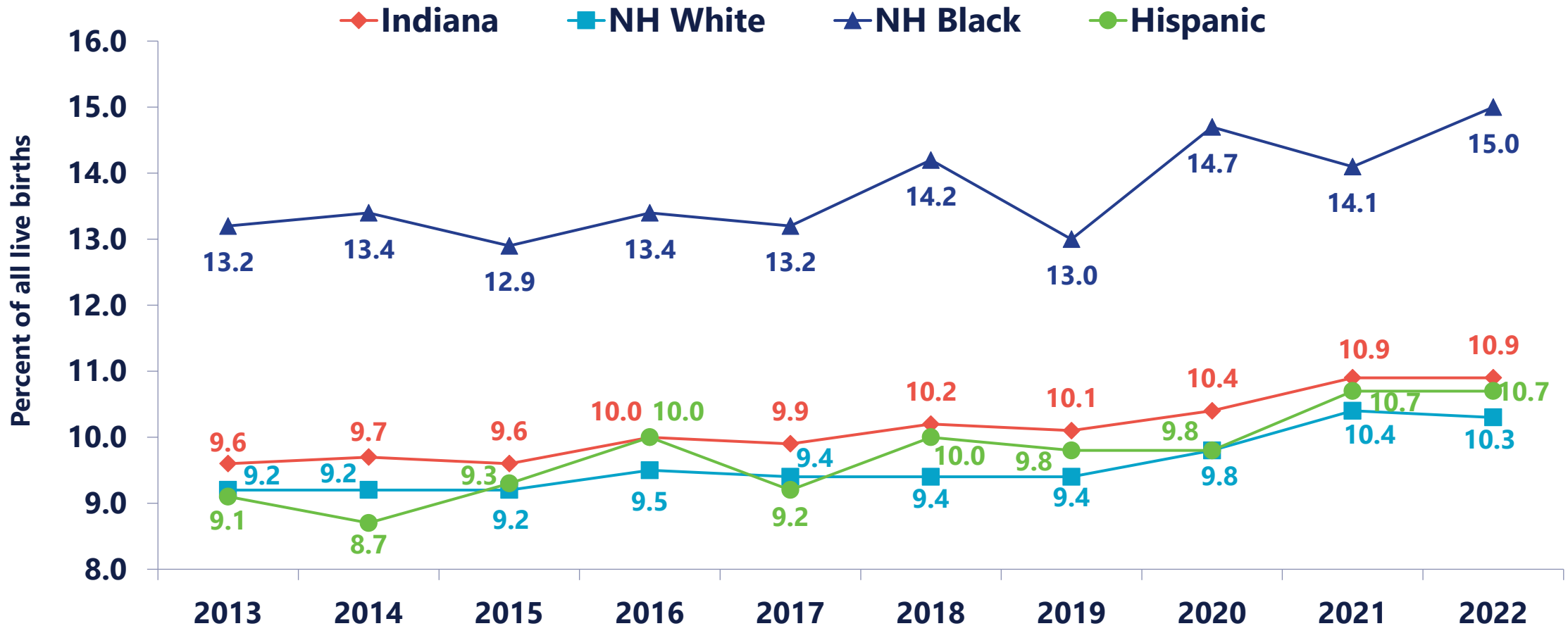
| Measure | Indiana | Non-Hispanic Black | Non-Hispanic White | Hispanic |
|--|---------|--------------------|--------------------|----------|
| Preterm (< 37 weeks gestation) | 10.9% | 15.0% ↑ | 10.3% ↓ | 10.7% |
| Low birthweight (< 2500 g) | 8.7% ↑ | 15.1% ↑ | 7.6% ↑ | 8.1% ↓ |
| Very low birthweight (< 1500 g) | 1.4% ↑ | 3.0% ↑ | 1.1% | 1.3% ↓ |
| No early prenatal care (first trimester) | 29.1% ↑ | 42.9% ↑ | 23.4% ↓ | 44.4% ↑ |
| Teen pregnancy | 4.7% ↓ | 6.8% ↓ | 3.8% ↓ | 7.9% ↓ |
| Breastfeeding (at discharge) | 83.9% ↑ | 77.5% ↑ | 84.6% ↑ | 86.0% ↑ |

Percentage of preterm (obstetric estimate < 37 weeks) Indiana, U.S. and Healthy People Goals, 2013-2022

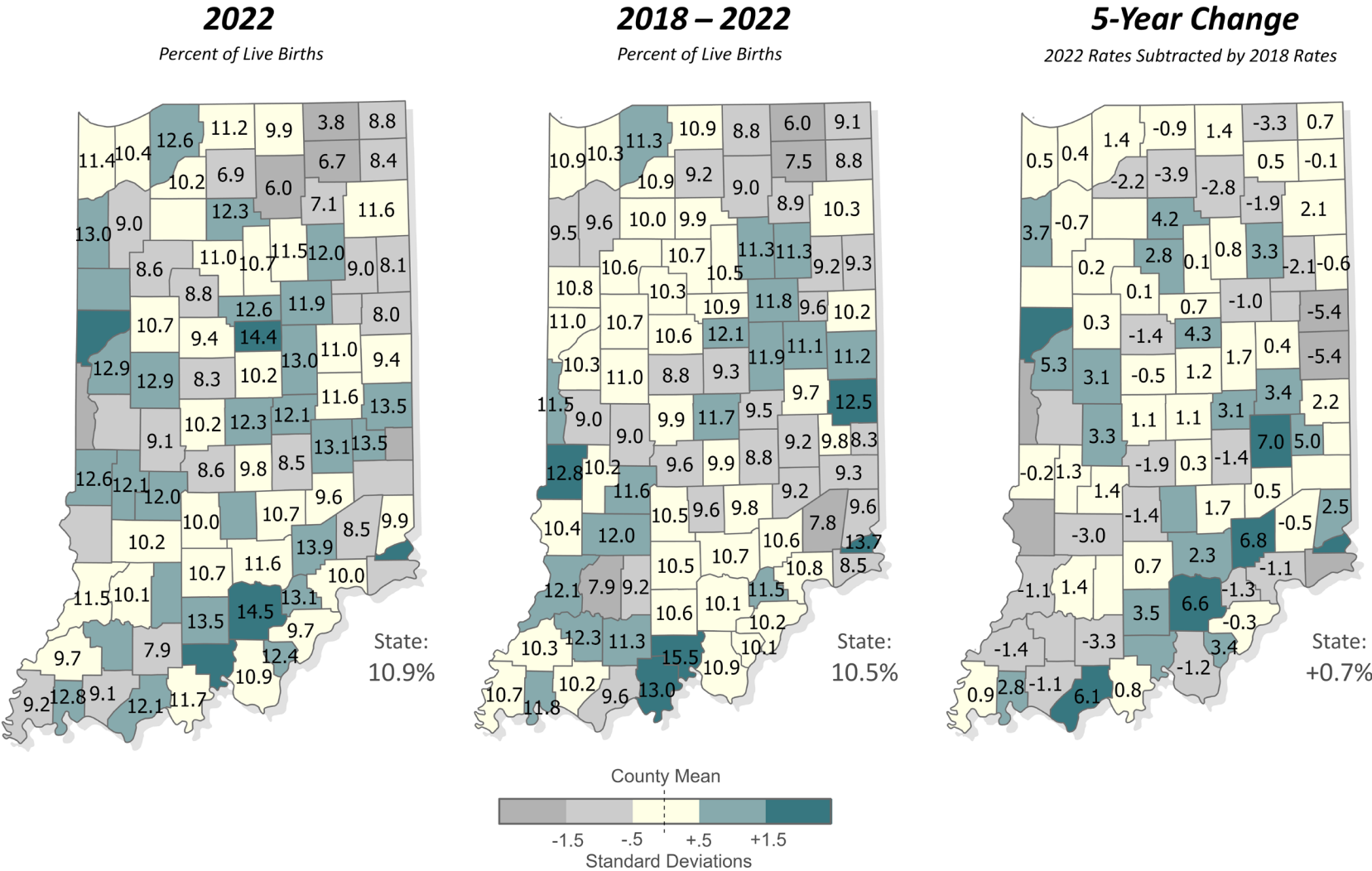


Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
 United States Original: Centers for Disease Control and Prevention National Center for Health Statistics
 Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

Percentage of preterm (obstetric estimate < 37 weeks) Indiana by race and ethnicity, 2013-2022



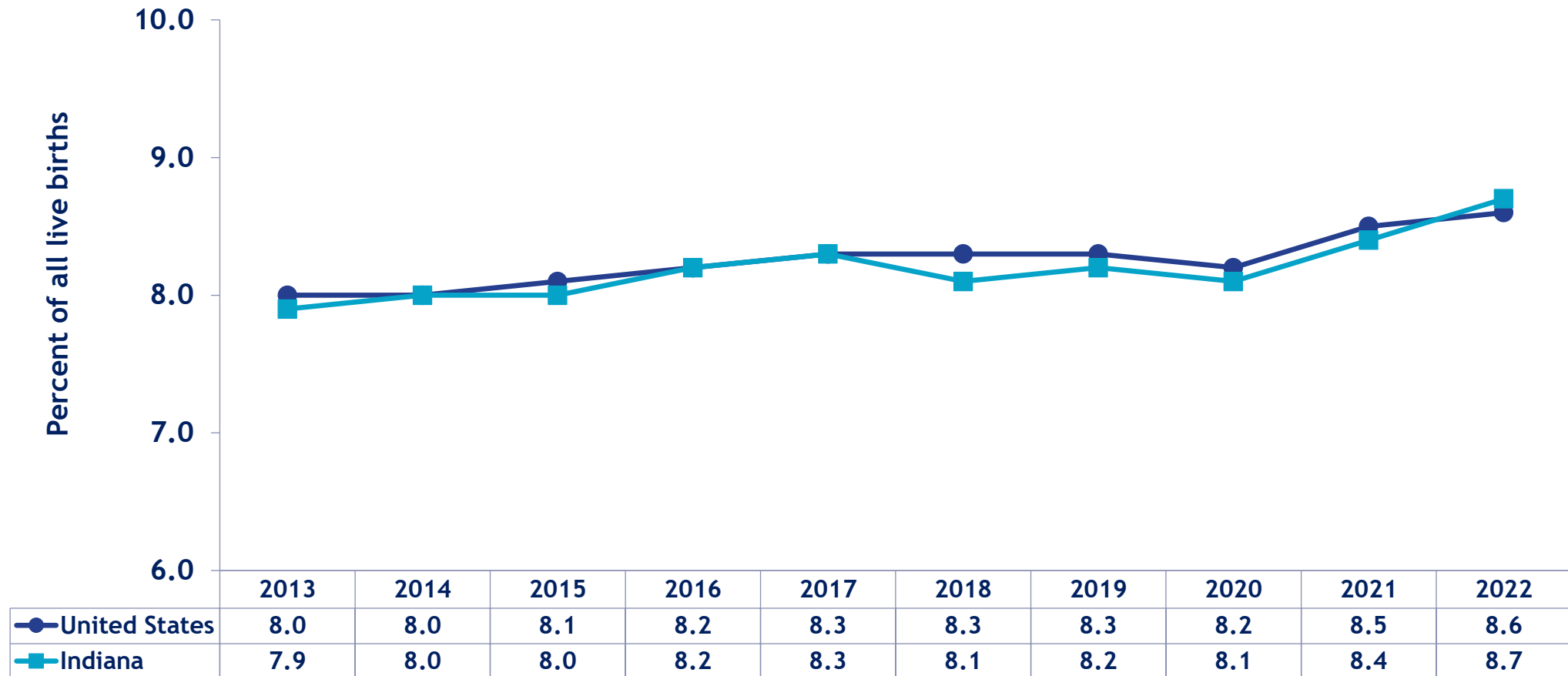
Preterm Births



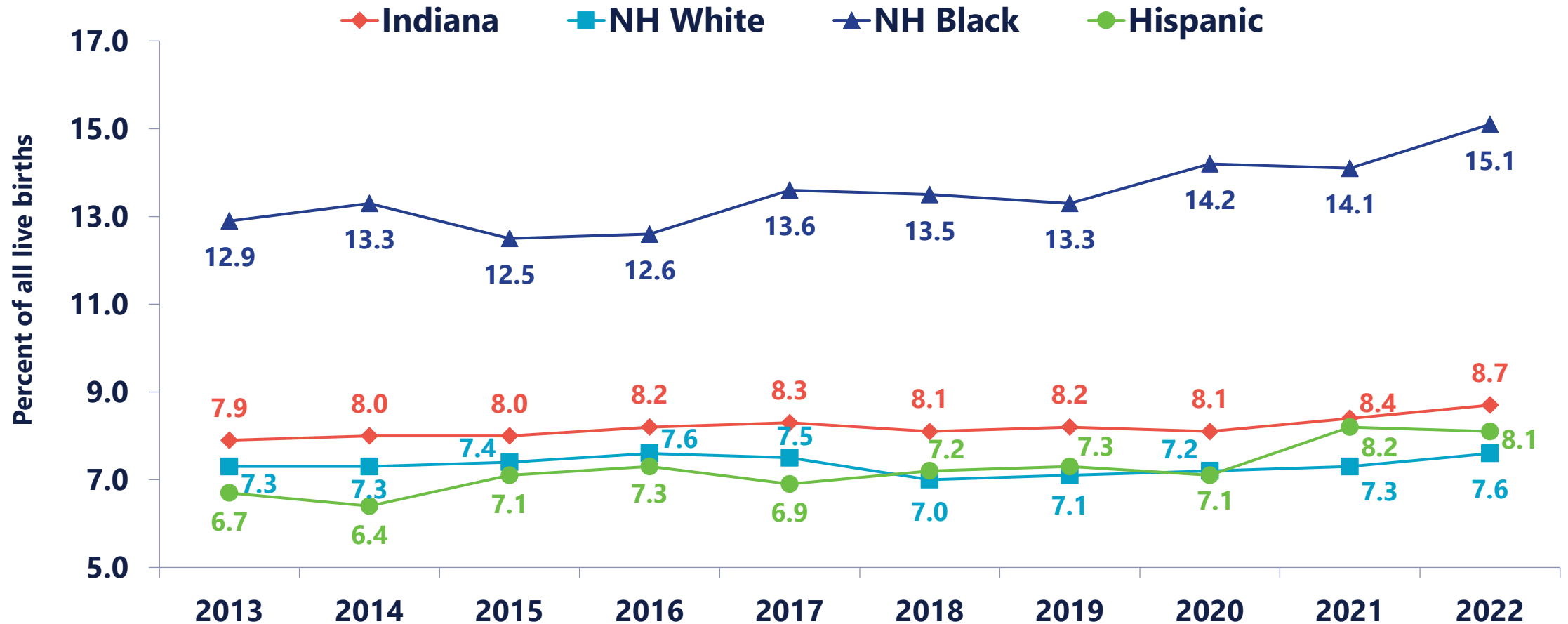
Only stable county percentages are labeled (≥ 20 events). Counties with less than 5 events are suppressed.

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2024

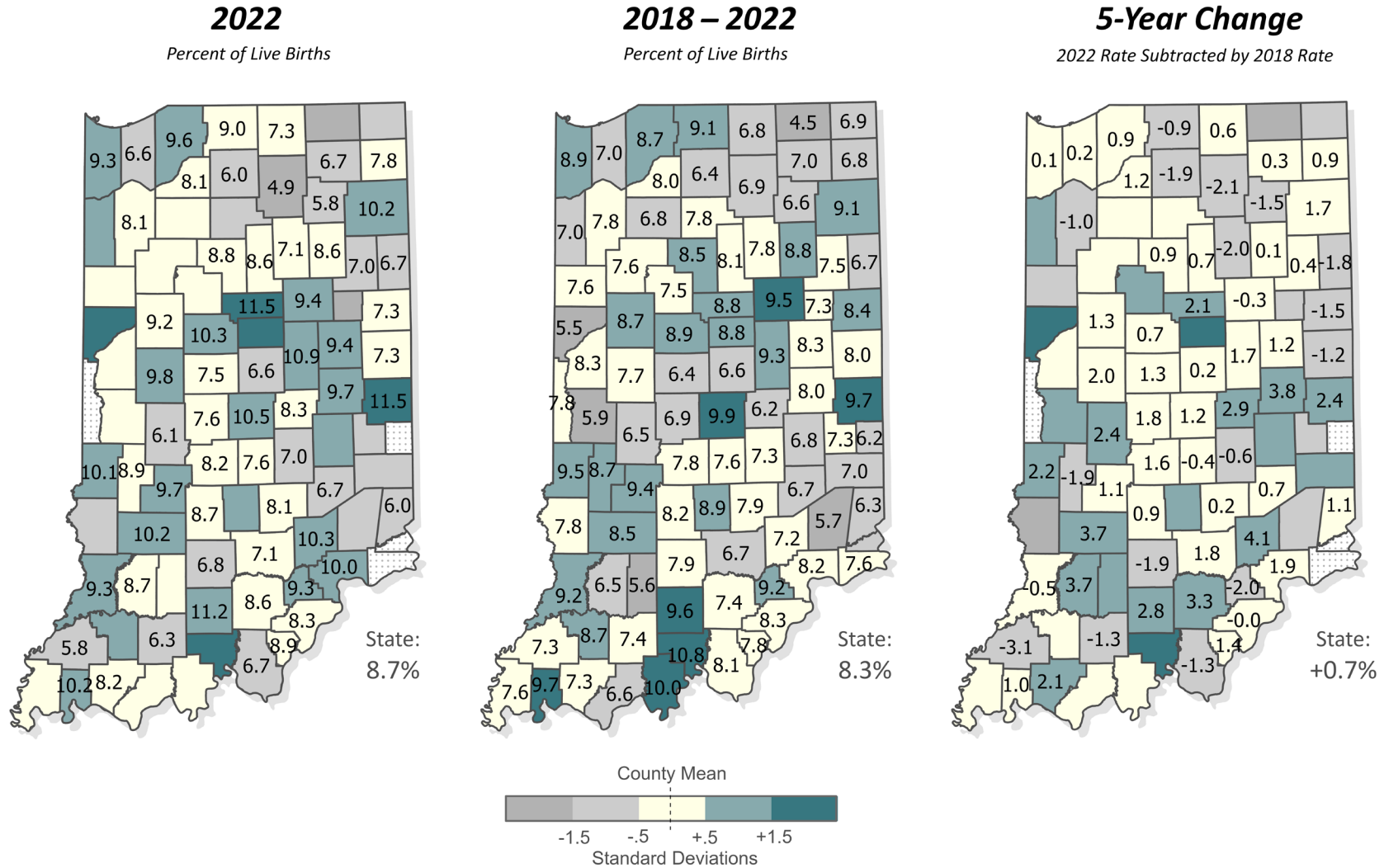
Percentage of low birthweight (< 2,500 grams) Indiana, U.S. and Healthy People goal, 2013-2022



Percentage of low birthweight (< 2,500 grams) Indiana by Race and Ethnicity, 2013-2022



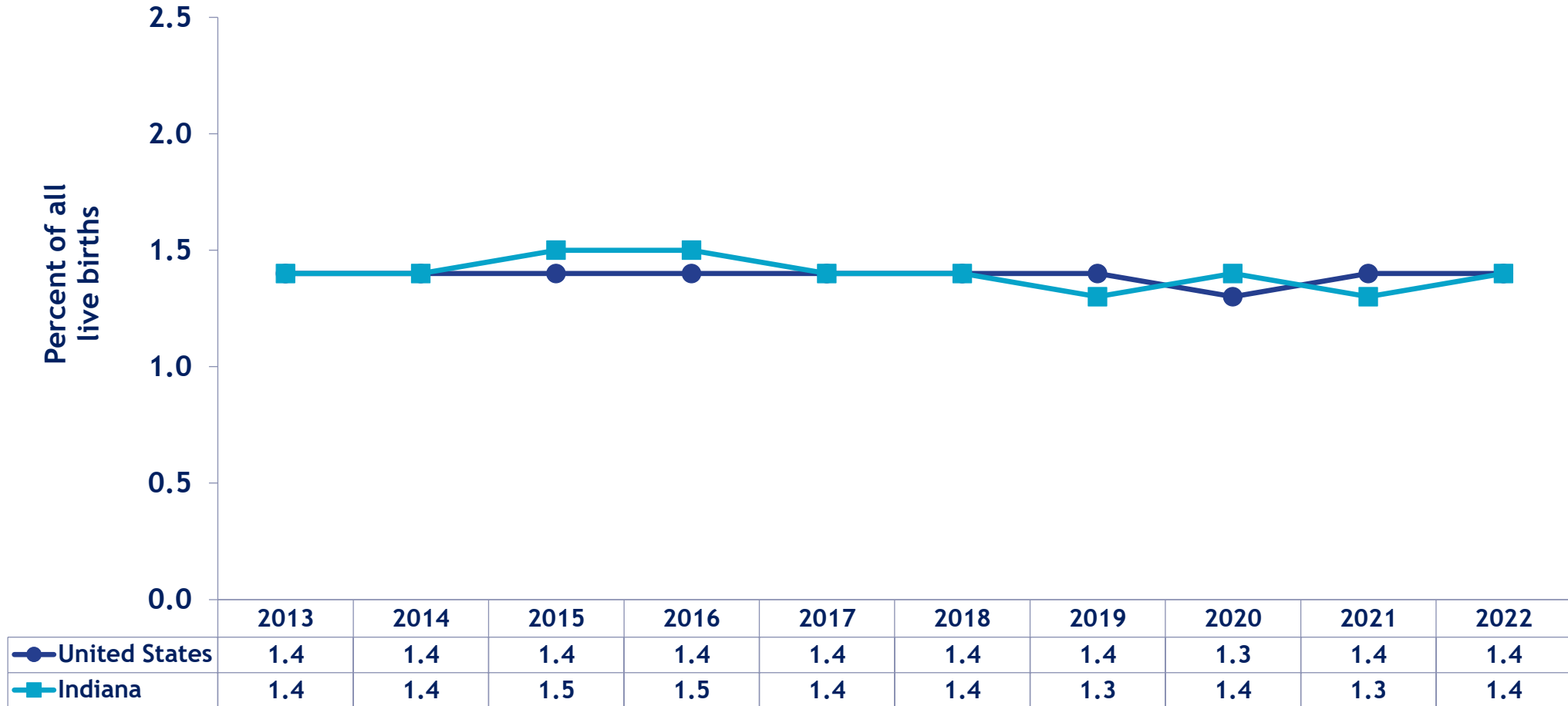
Low Birth Weight Births



Only stable county percentages are labeled (≥ 20 events). Counties with less than 5 events are suppressed.

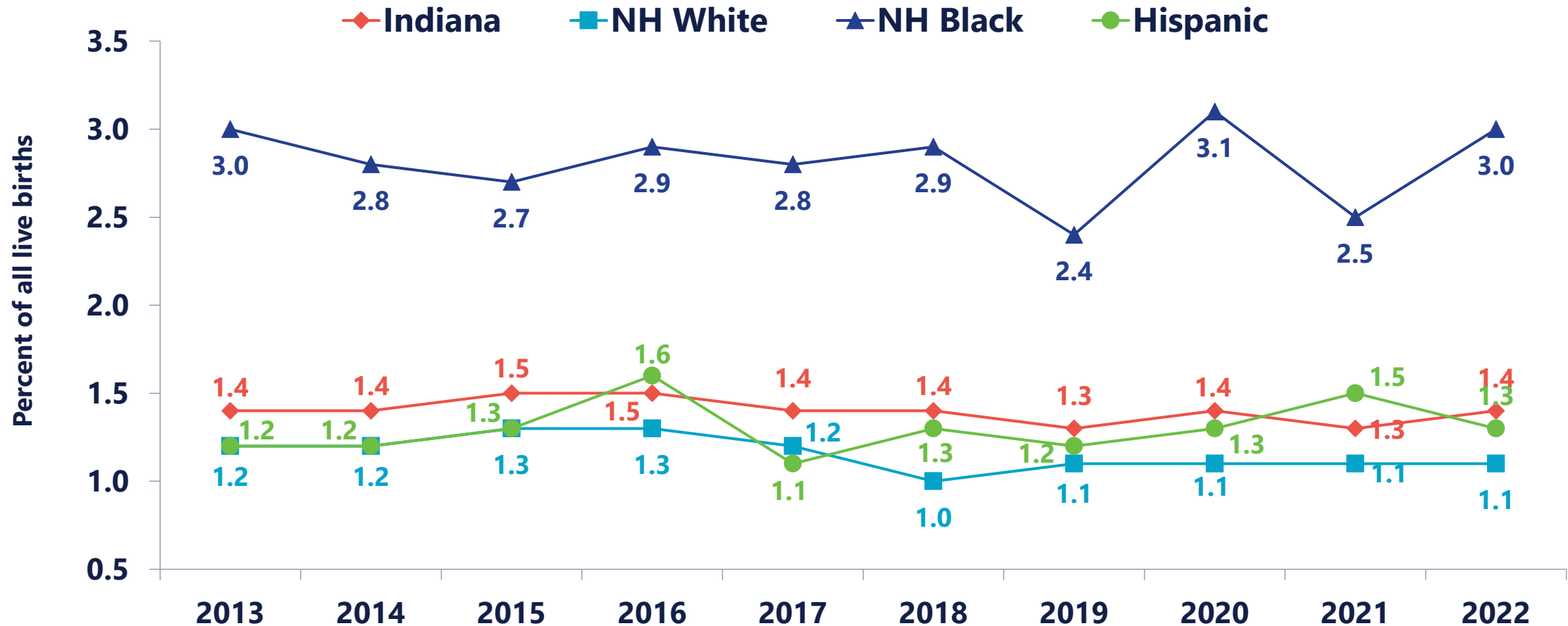
Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2024

Percentage of very low birthweight (< 1,500 grams) Indiana, U.S. and Healthy People Goal, 2013-2022

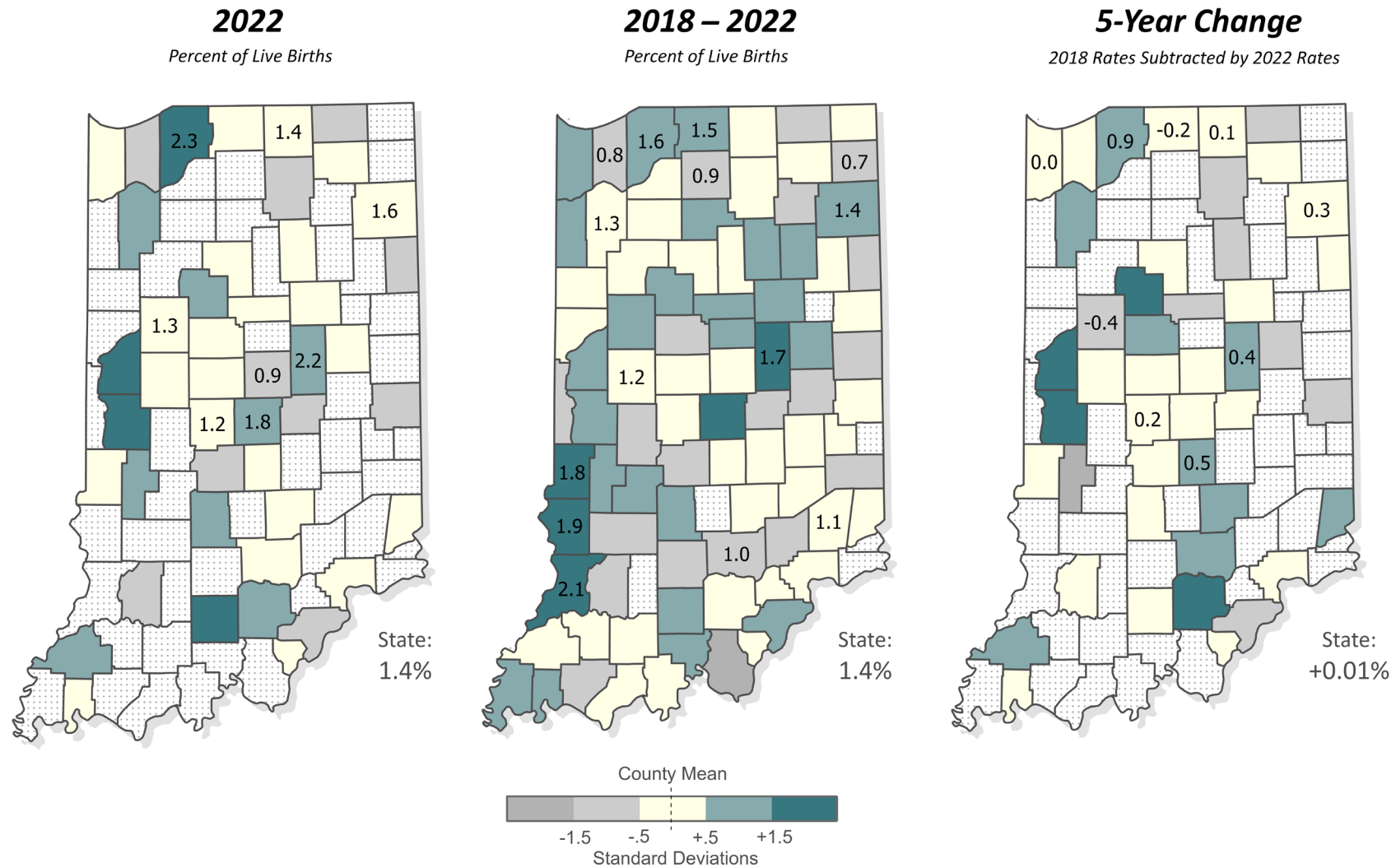


Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
 United States Original: Centers for Disease Control and Prevention National Center for Health Statistics
 Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

Percentage of very low birthweight (< 1,500 grams) Indiana by Race and Ethnicity, 2013-2022



Very Low Birth Weight Births

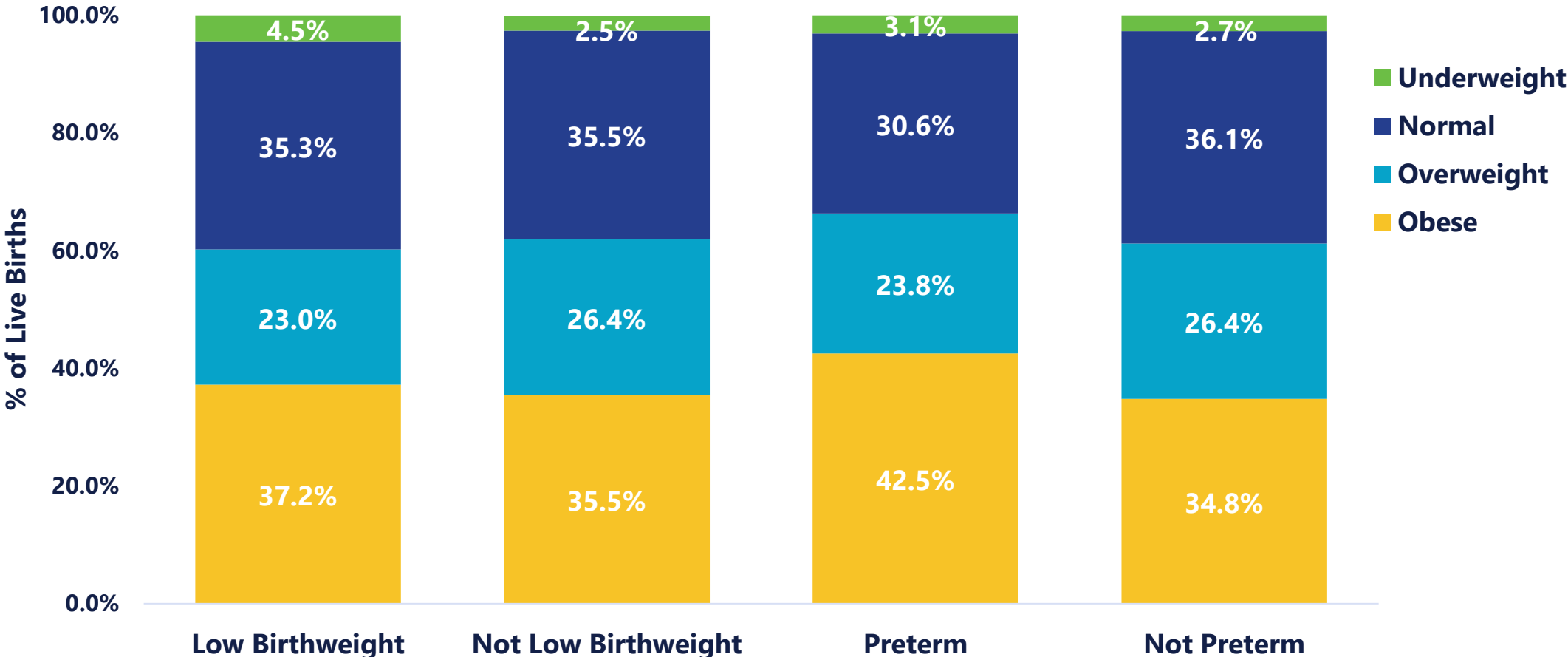


Only stable county percentages are labeled (≥ 20 events). Counties with less than 5 events are suppressed.

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2024

Low birthweight and preterm by BMI

Indiana 2022



Low Birthweight = < 2,500 grams Preterm = Gestation < 37 weeks



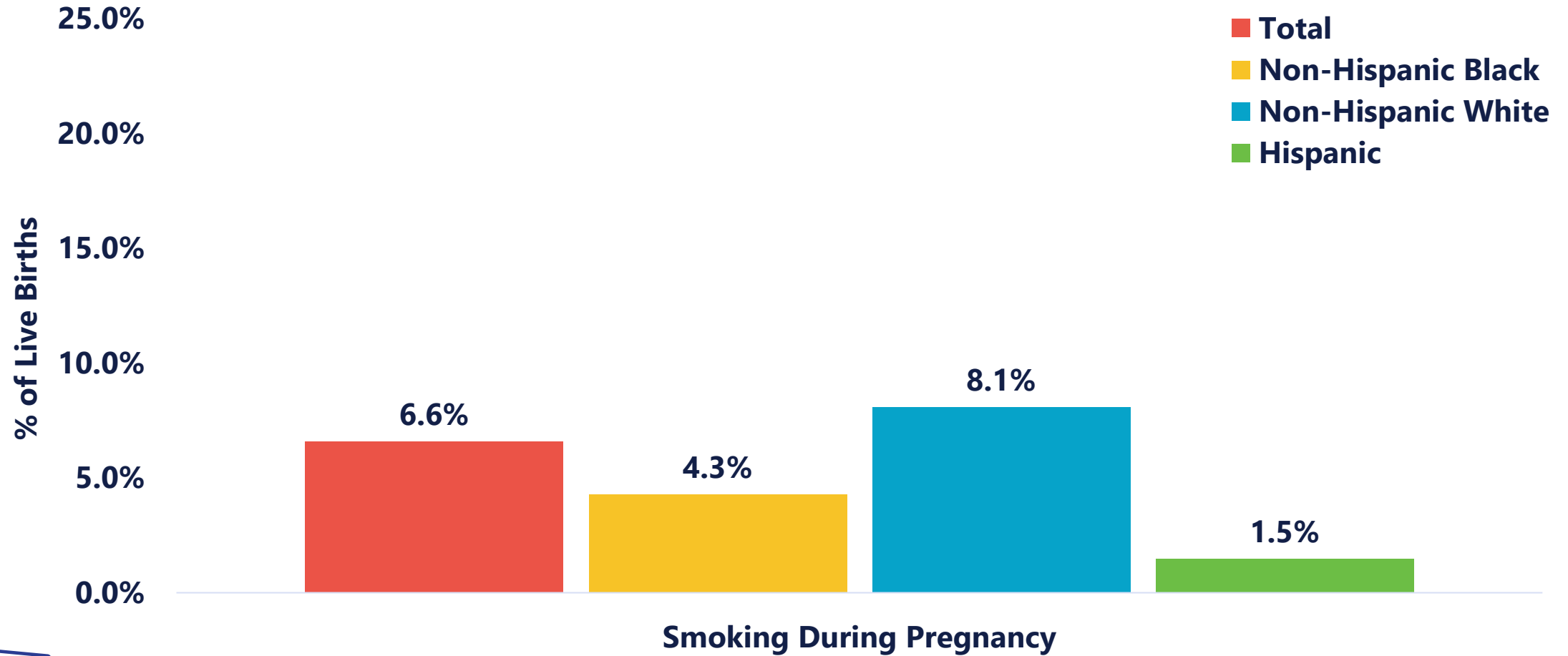
Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
 Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

2021 and 2022 smoking during pregnancy

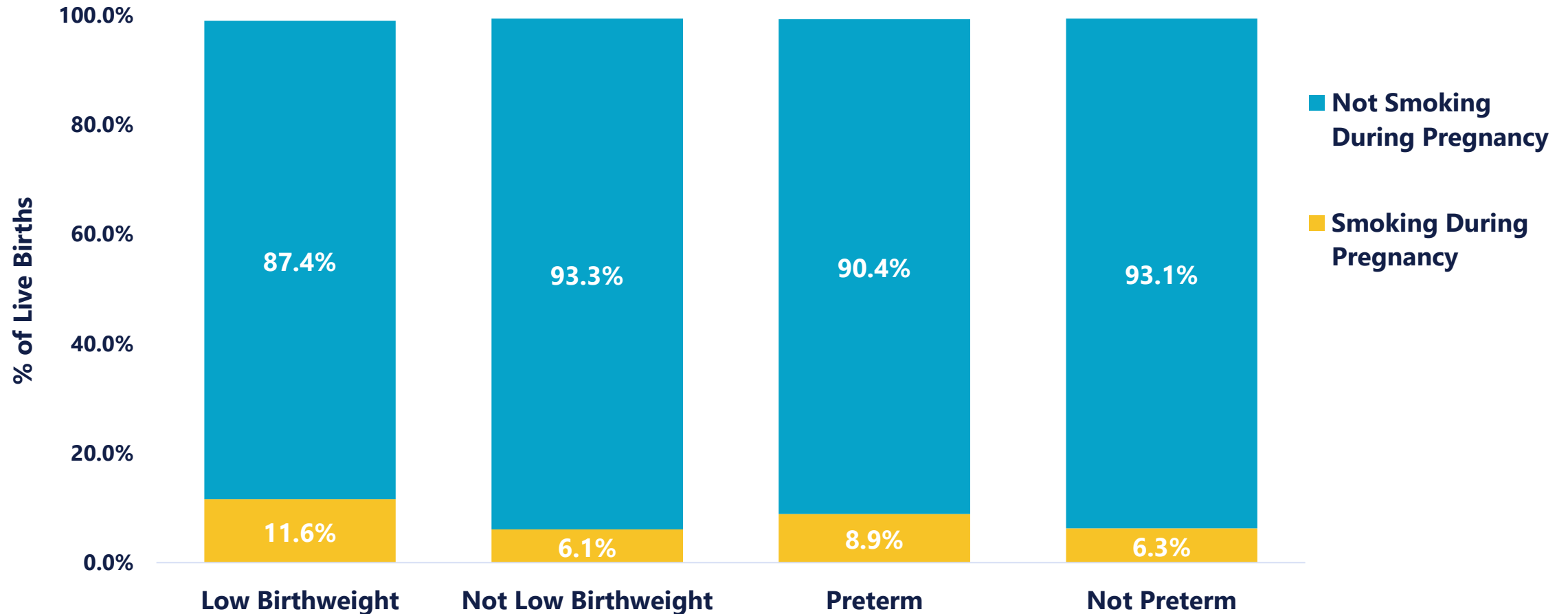
- 2022 births exposed to **cigarette smoking during pregnancy: 6.6%**
 - 2021 births exposed to cigarette smoking during pregnancy: 9.0%
- The smoking variable has changed in the way that is collected, and as such these percentages should not be compared with previous years
- We attempted to calculate a more complete statistic for people who had smoked during pregnancy using new variables that had been added to our data. However, we determined that these newer variables are not currently ready for reporting.
- For this reason, we have decided to revert to our method of reporting before our DRIVE transition. This means that smoking during pregnancy is calculated using variables for each trimester indicating whether the person had smoked during that trimester.
 - Due to the nature of this variable, it is possible that this percentage is an under representation of the true smoking during pregnancy percentage

Smoking during pregnancy

Indiana by race and ethnicity, 2022



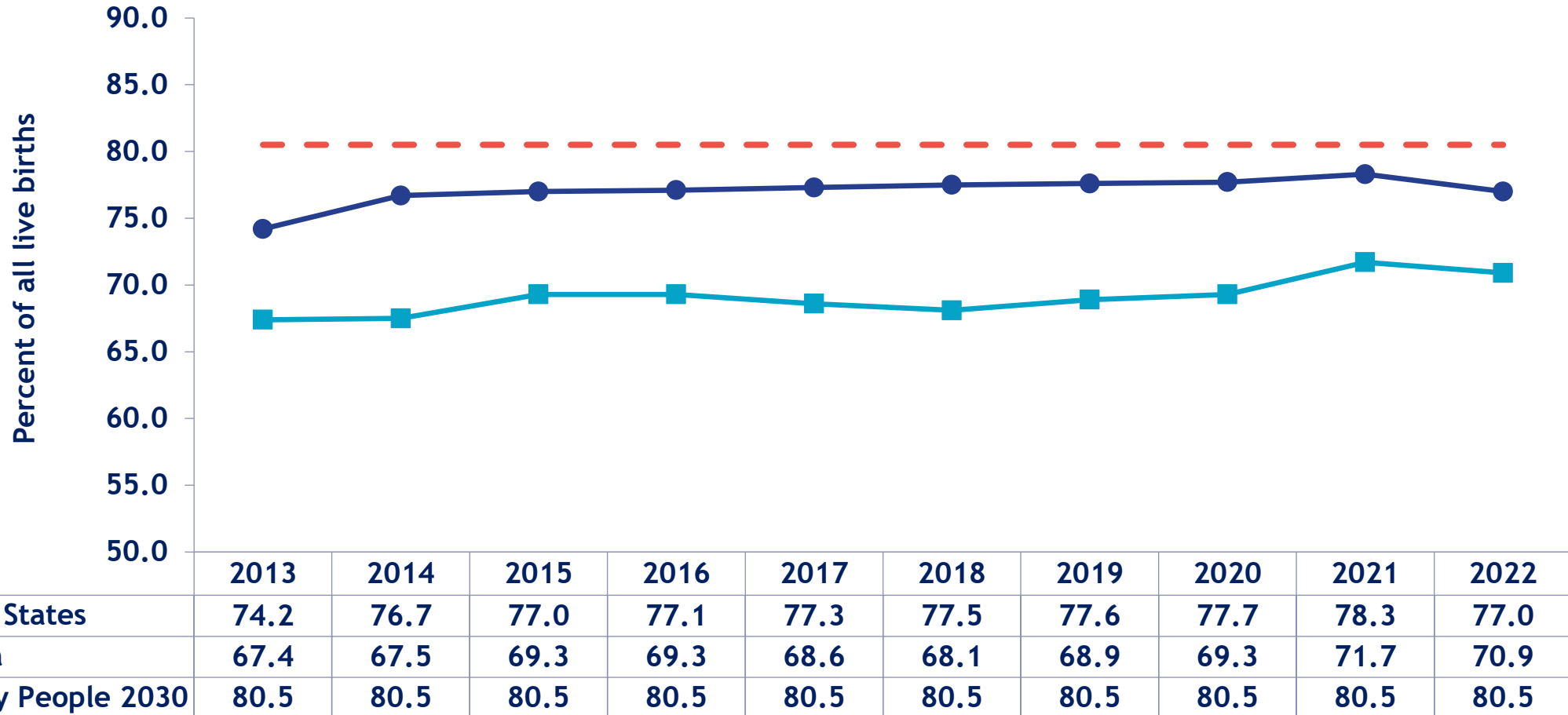
Low birthweight and preterm by smoking status, Indiana 2022



Low Birthweight = < 2,500 grams Preterm = Gestation < 37 weeks

Percentage receiving PNC first trimester

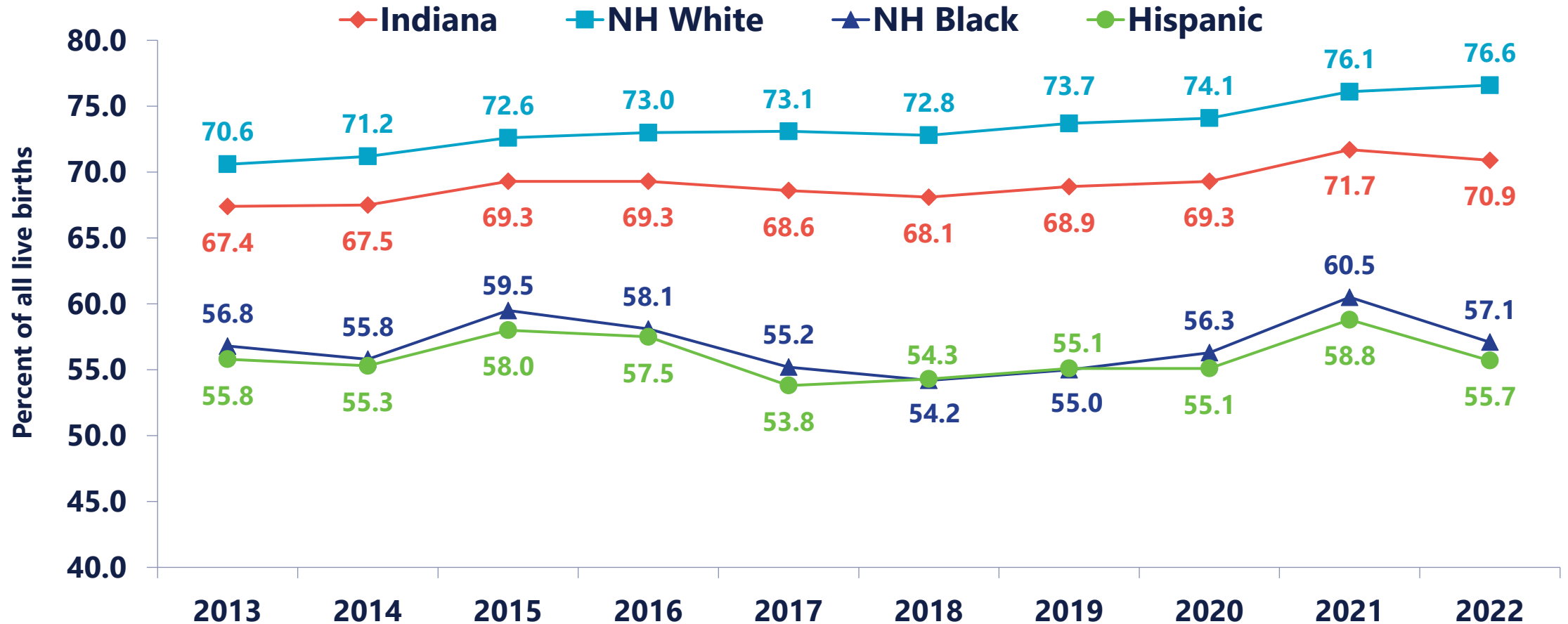
Indiana, U.S. and Healthy People Goal, 2013-2022



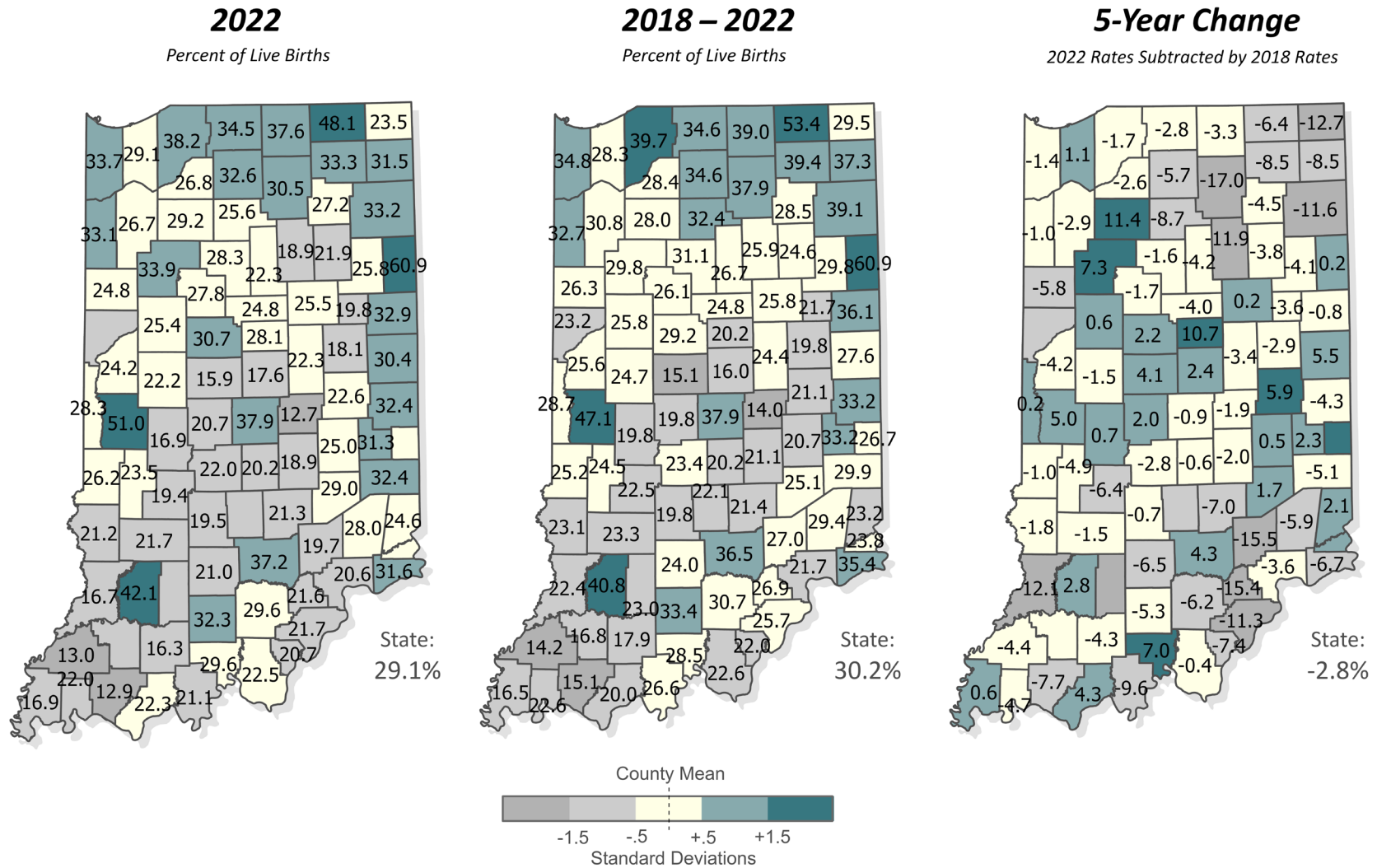
Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
 United States Original: Centers for Disease Control and Prevention National Center for Health Statistics
 Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

Percentage receiving PNC first trimester

Indiana by race and ethnicity, 2013-2022



No Early Prenatal Care

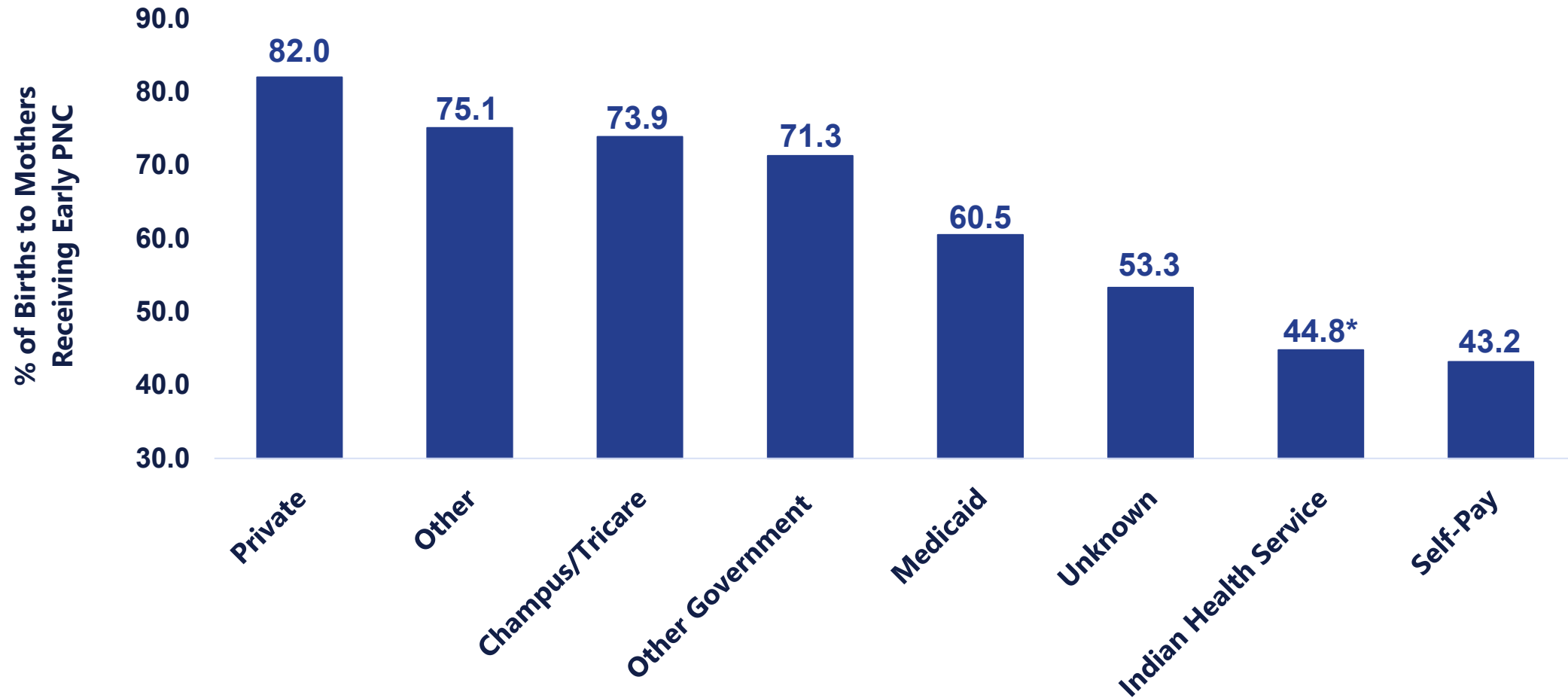


Only stable county percentages are labeled (≥ 20 events). Counties with less than 5 events are suppressed.

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2024

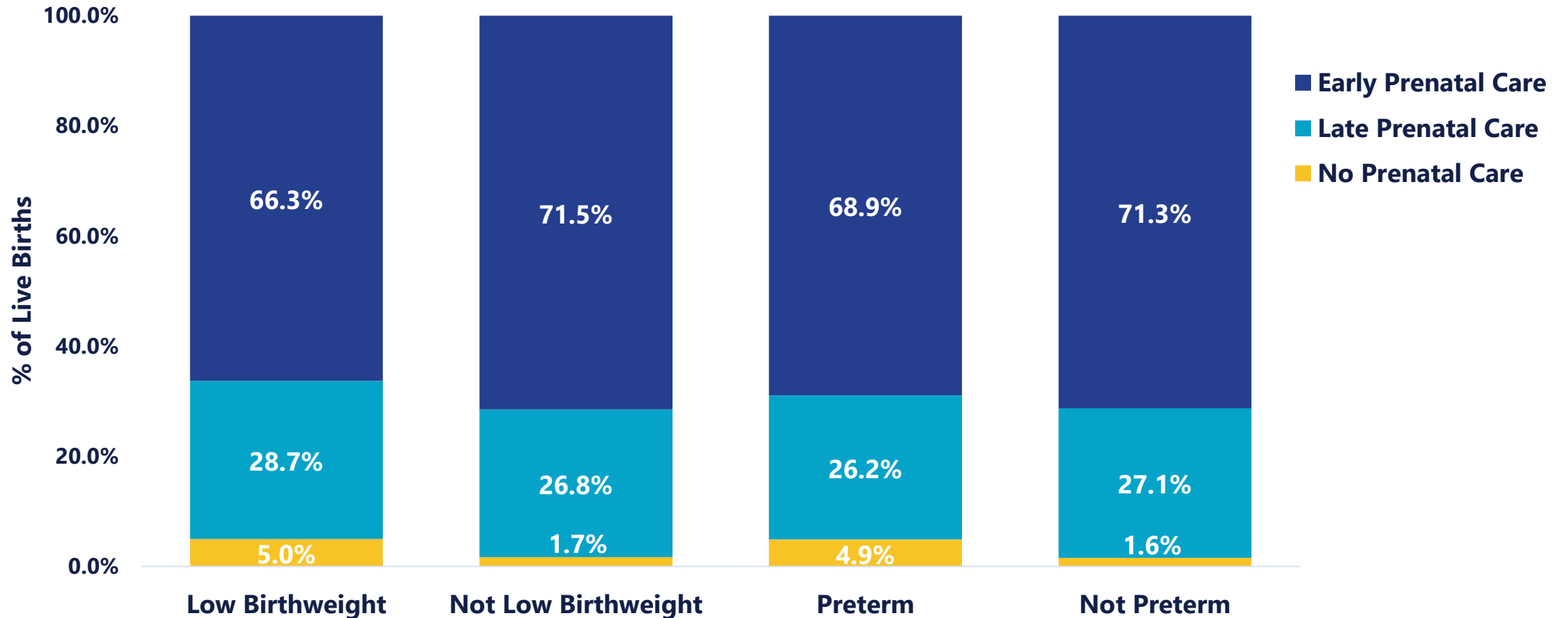
First trimester PNC by insurance type

Indiana 2022



Low birthweight and preterm by prenatal care

Indiana 2022



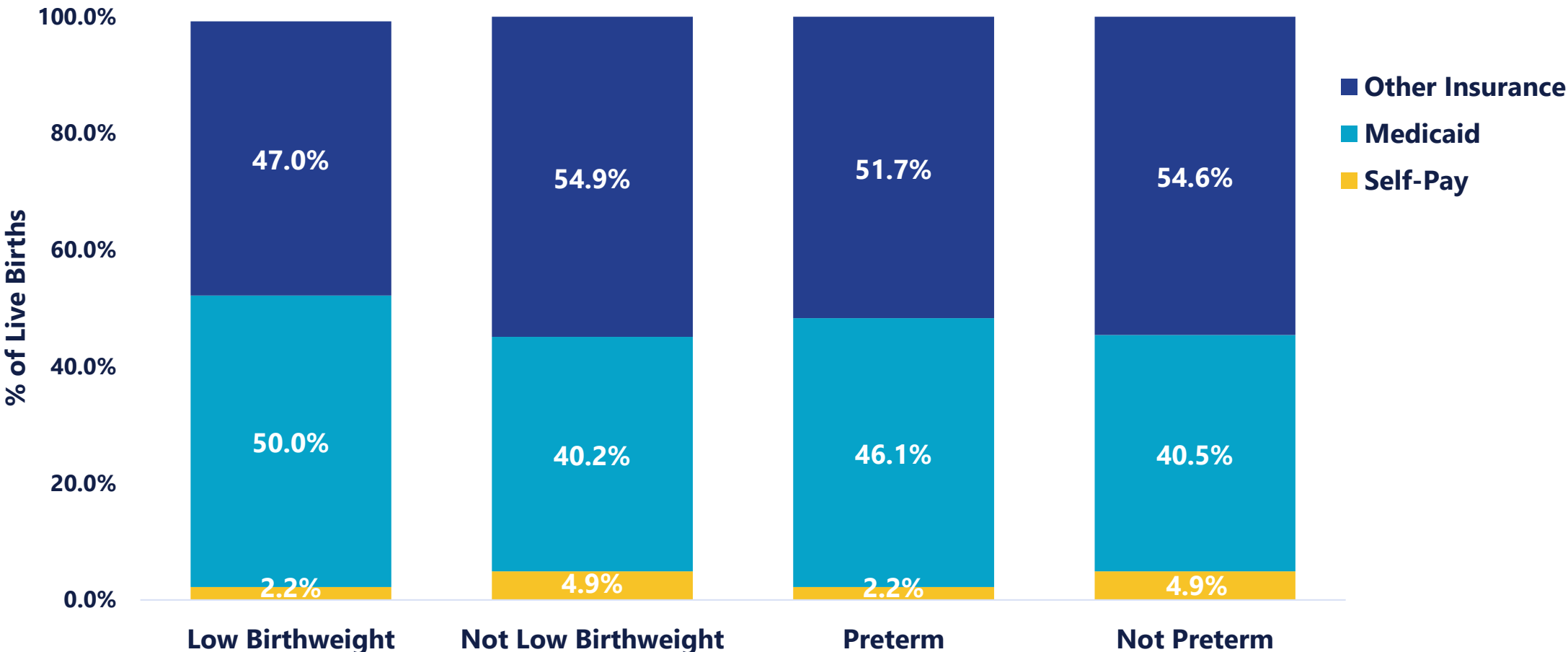
Early PNC = 1st trimester
Late PNC = After the 1st trimester

Low Birthweight = < 2,500 grams
Preterm = Gestation < 37 weeks



Low birthweight and preterm by insurance

Indiana 2022



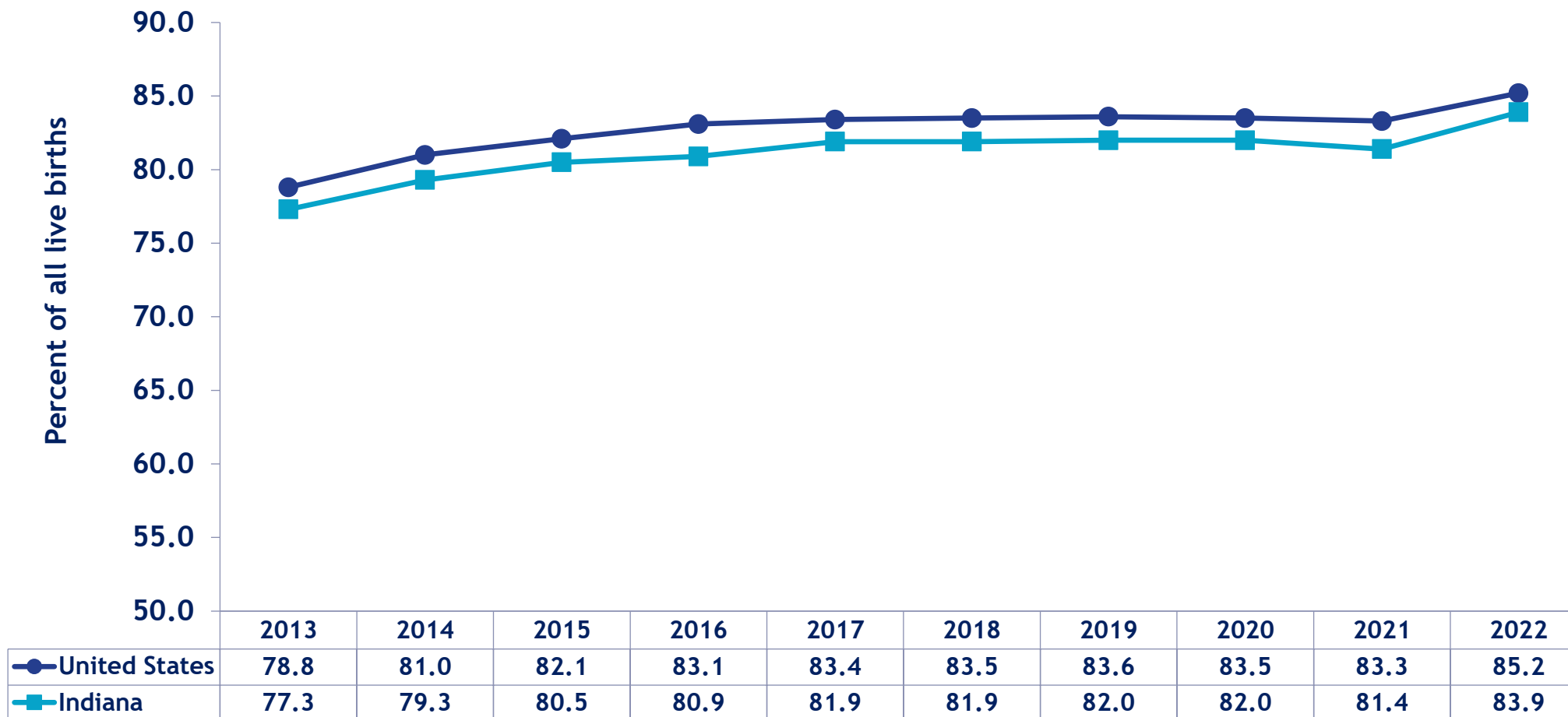
Low Birthweight = < 2,500 grams Preterm = Gestation < 37 weeks



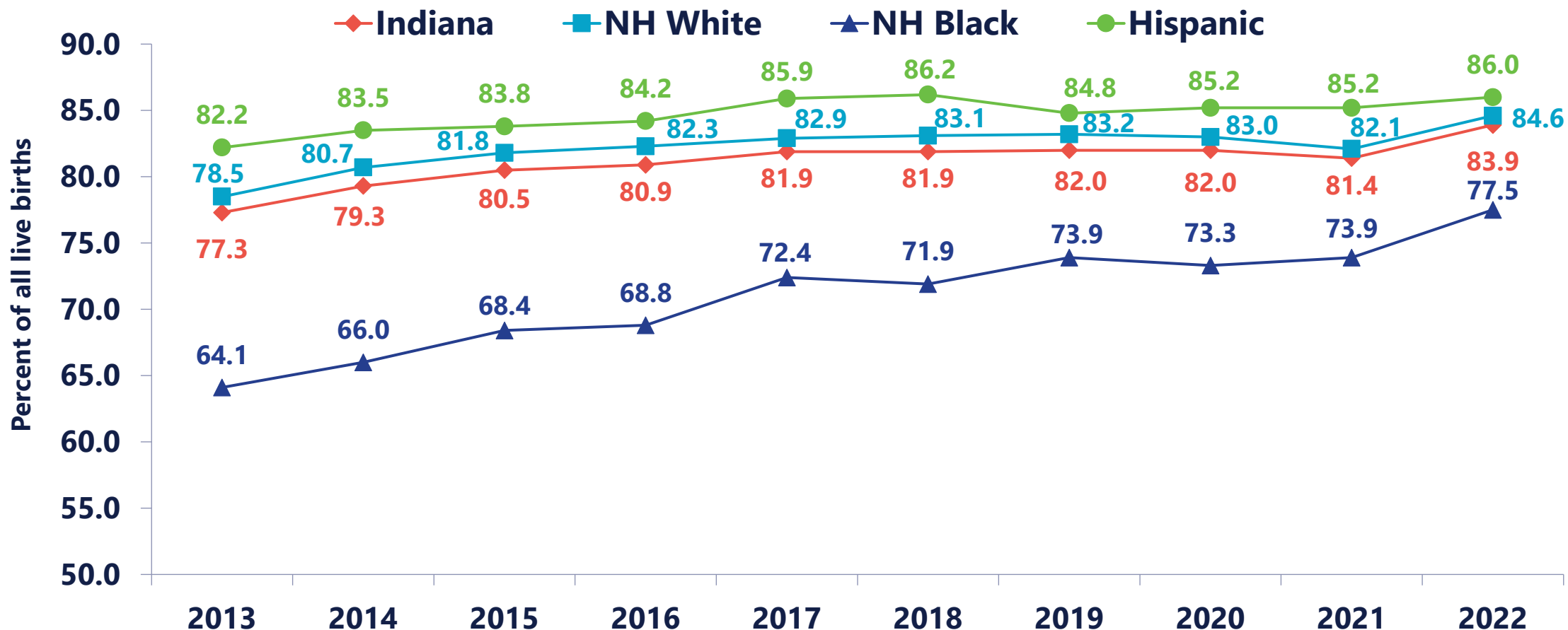
Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 5, 2024]
Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

Percentage of infants breastfed at hospital discharge

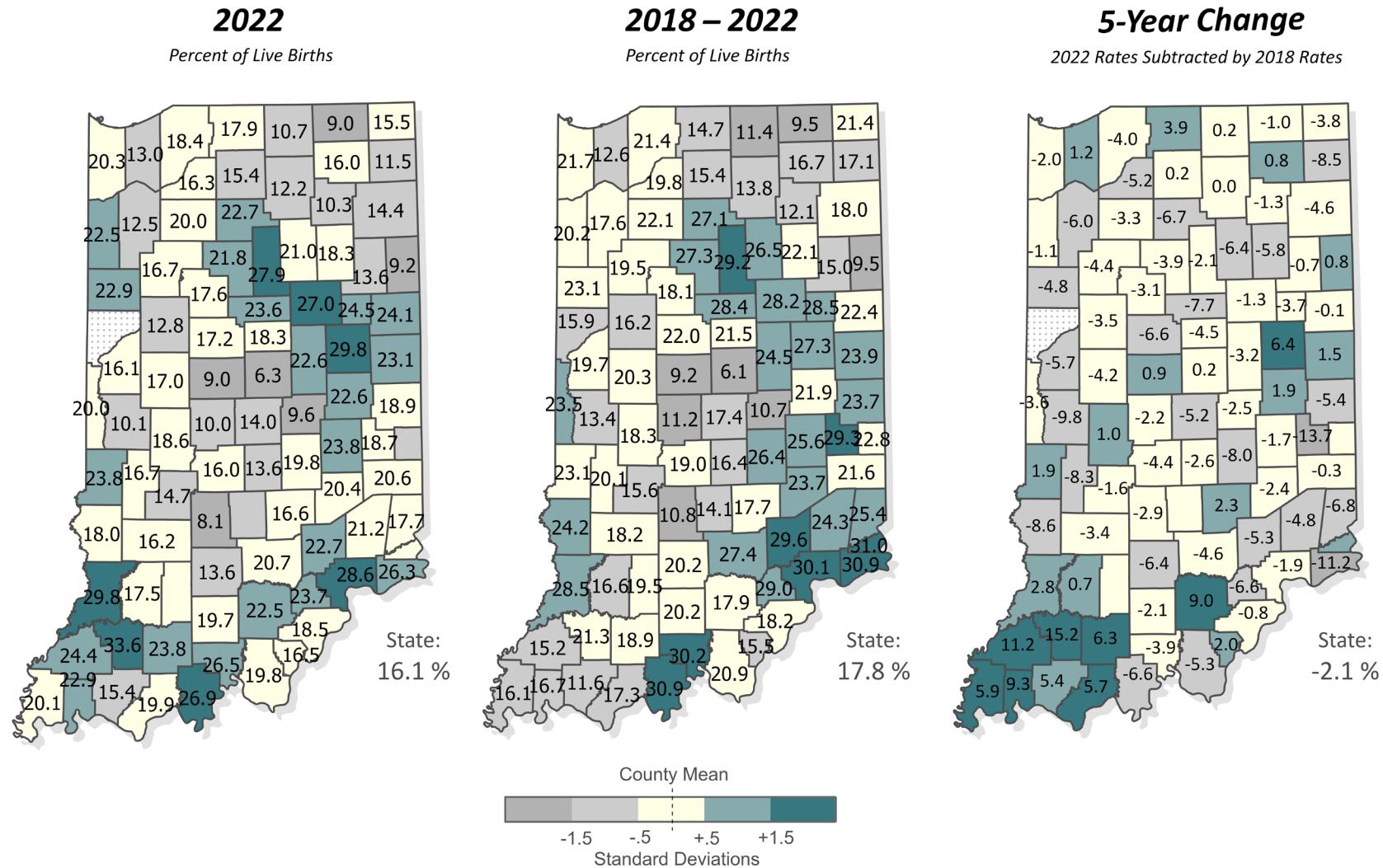
Indiana, and U.S., 2013-2022



Percentage of infants breastfed at hospital discharge Indiana by race and ethnicity, 2013-2022



Infants Not Breastfed at Hospital Discharge



Only stable county percentages are labeled (≥ 20 events). Counties with less than 5 events are suppressed.

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG March 2024

2022 summary

- 577 infants in Indiana died before their first birthday
- Perinatal risks are the primary cause of infant mortality in Indiana
- More than 17% of infant deaths can be attributed to SUIDs
- Preterm births have been increasing in recent years and remained stable between 2021 and 2022
- Lower percentages of early prenatal care when compared to the U.S., which varies by race/ethnicity and insurance coverage
- Large disparities in all outcomes make prevention efforts complex