



Indiana
Department
of
Health

INDIANA INFANT MORTALITY & BIRTH OUTCOMES, 2021

MATERNAL & CHILD HEALTH
EPIDEMIOLOGY

4/12/2023

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.



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 **#1 indicator** of health status in the world.

Infant Mortality in Indiana

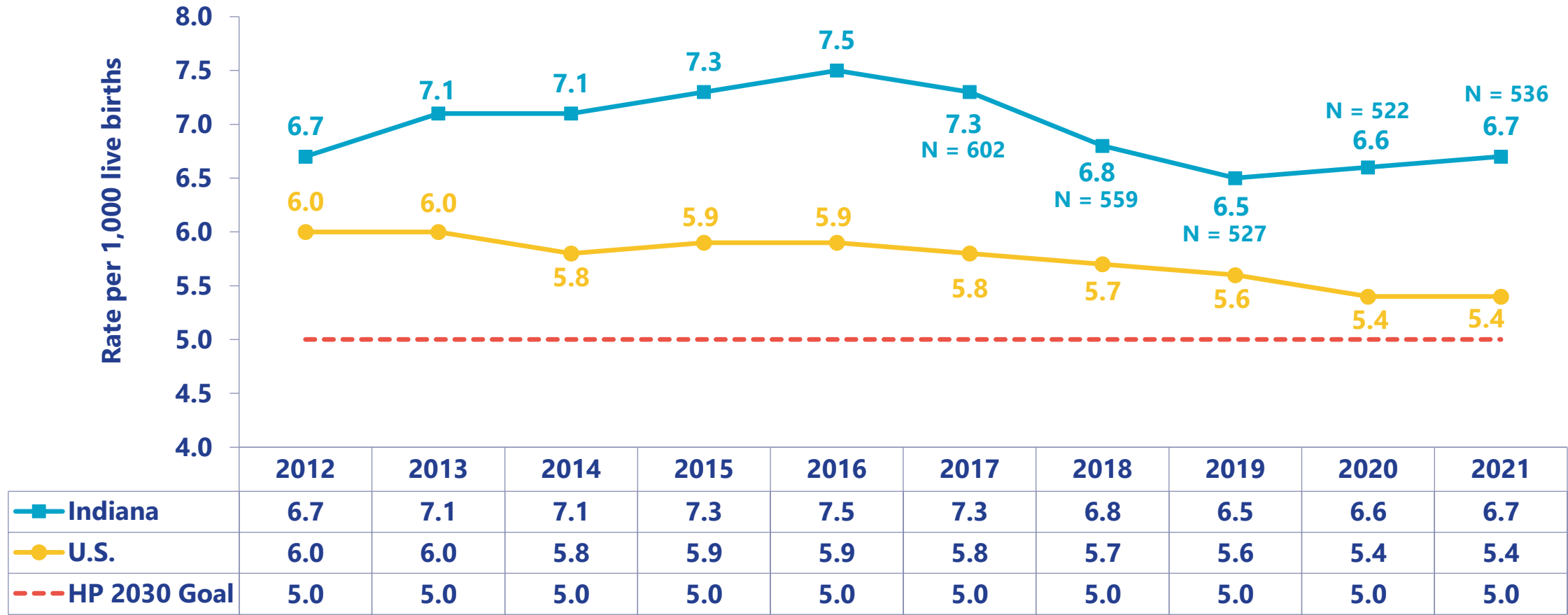


Infant Mortality in Indiana

- 536 Hoosier babies died before their 1st birthday in 2021:
 - Nearly 45 babies EVERY month
 - About 10 babies EVERY week
- More than 2,700 infant lives lost in the last 5 years:
 - Over 38 school buses at maximum capacity

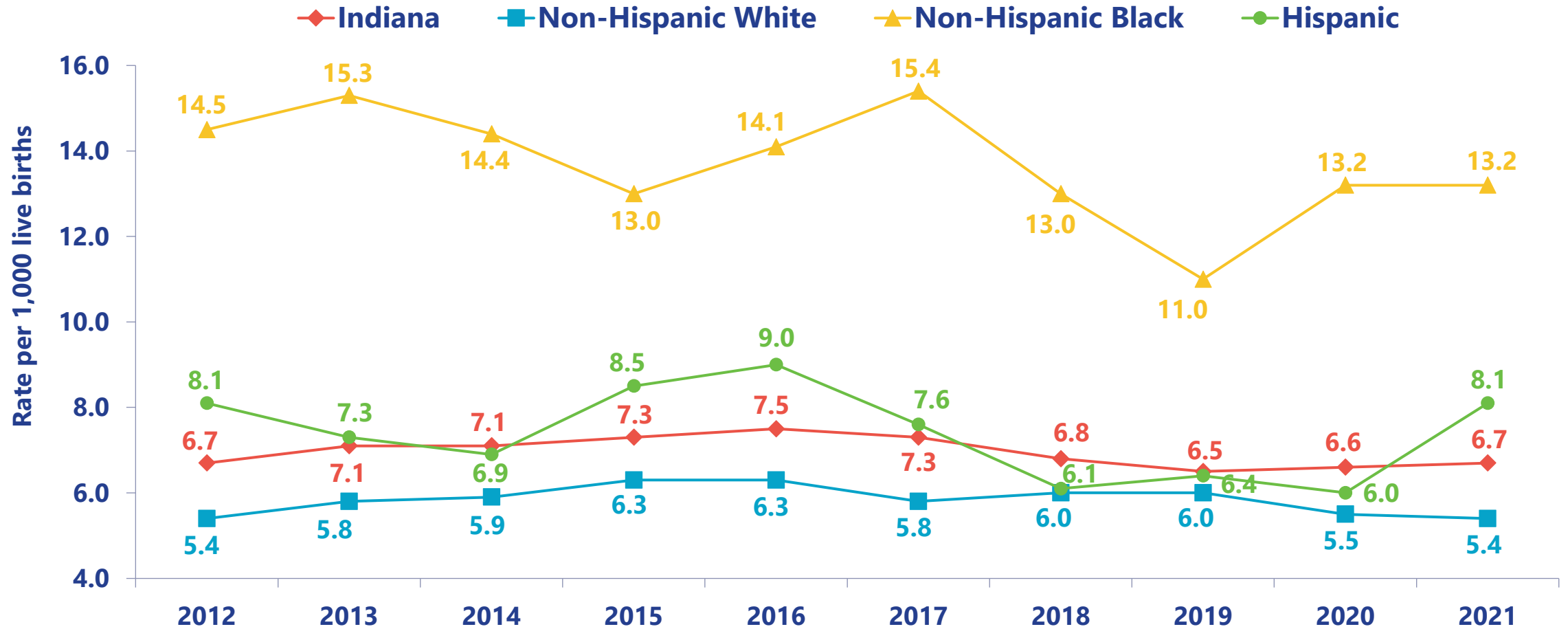
Infant Mortality Rates (IMRs)

2012-2021



Indiana IMRs by Race and Ethnicity

2012-2021

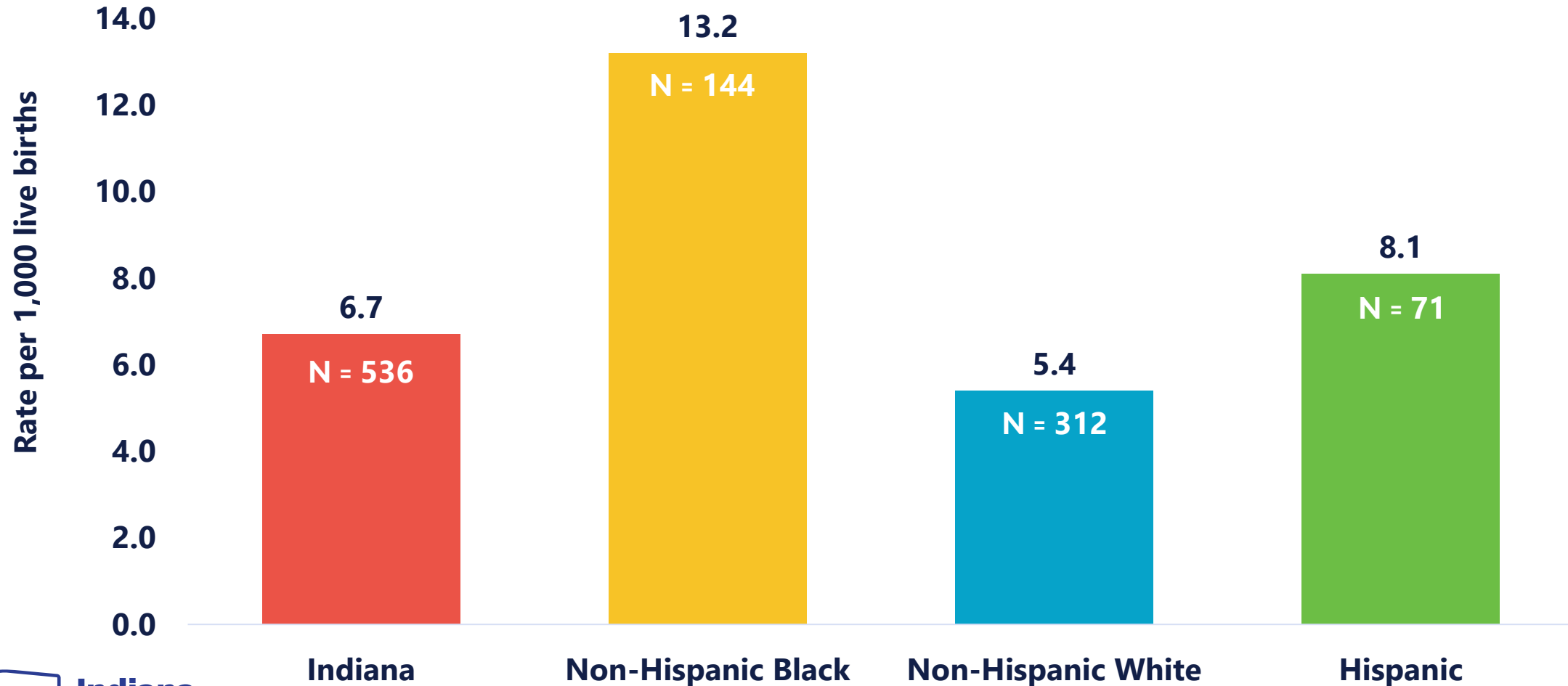


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Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [January 9, 2023]
Indiana Original Source: Indiana Department of Health, Vital Records, ODA, DAT

Infant Mortality by Race and Ethnicity

2021



Infant Mortality by Geography



Infant Mortality by Indiana Hospital Region

2017-2021

Region	Total	Non-Hispanic White	Non-Hispanic Black	Hispanic
Central	6.4	5.1	10.8	5.7
Central Southwestern	7.8	7.5	12.7*	**
Eastern	7.9	6.9	16.2	8.1*
Midwestern	7.2	7.0	**	7.8*
Northeastern	6.6	5.7	15.6	8.5
Northern	8.1	6.6	17.1	7.0
Northwest	7.0	4.0	13.7	7.4
Southeastern	6.2	6.5	18.3*	**
Southern	6.3	5.9	15.5*	8.1*
Southwest	6.1	5.1	18.1	6.6*
Western	6.3	5.7	15.4	6.3*

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

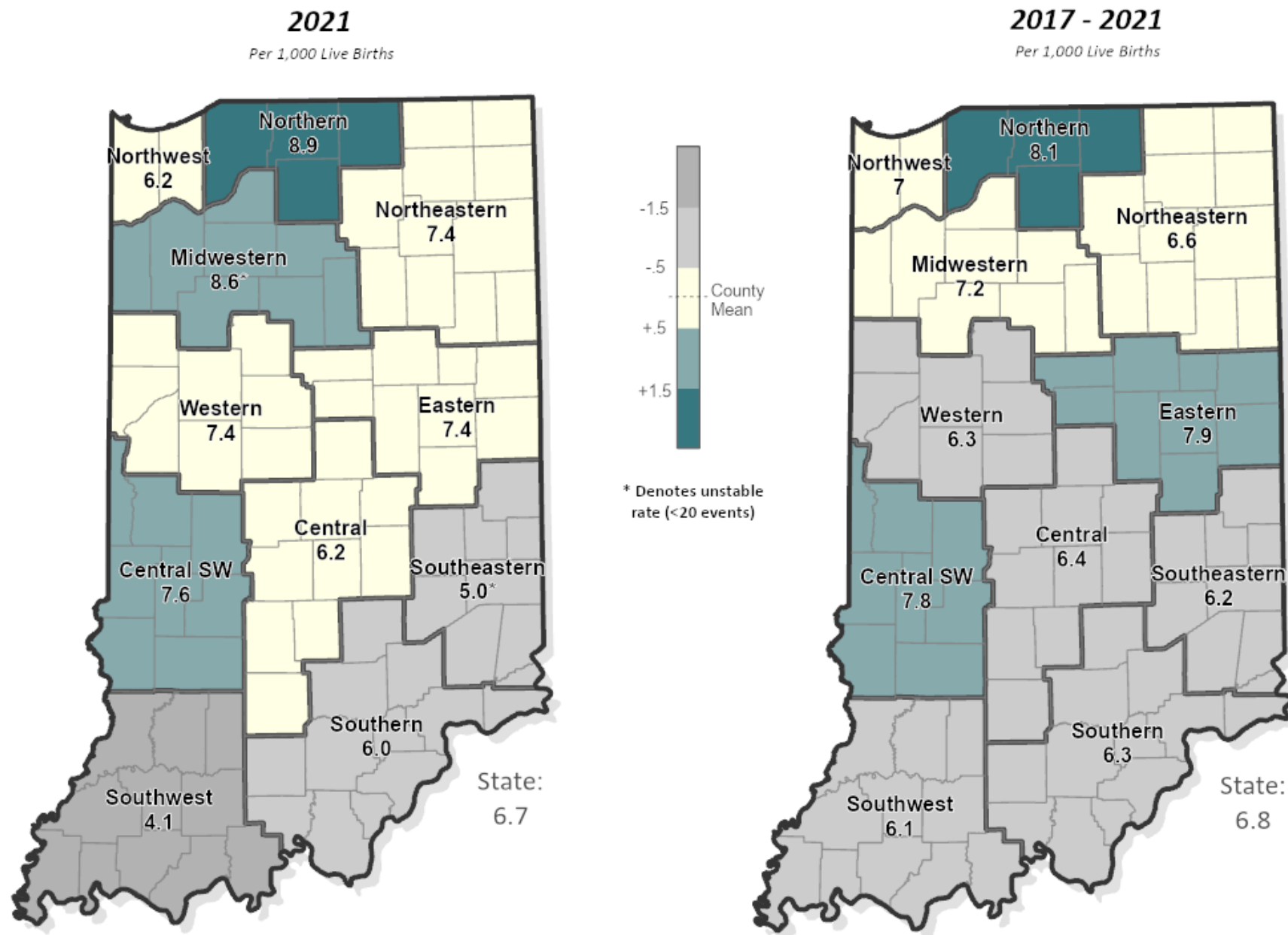
**Rates based on counts less than 5 have been suppressed.



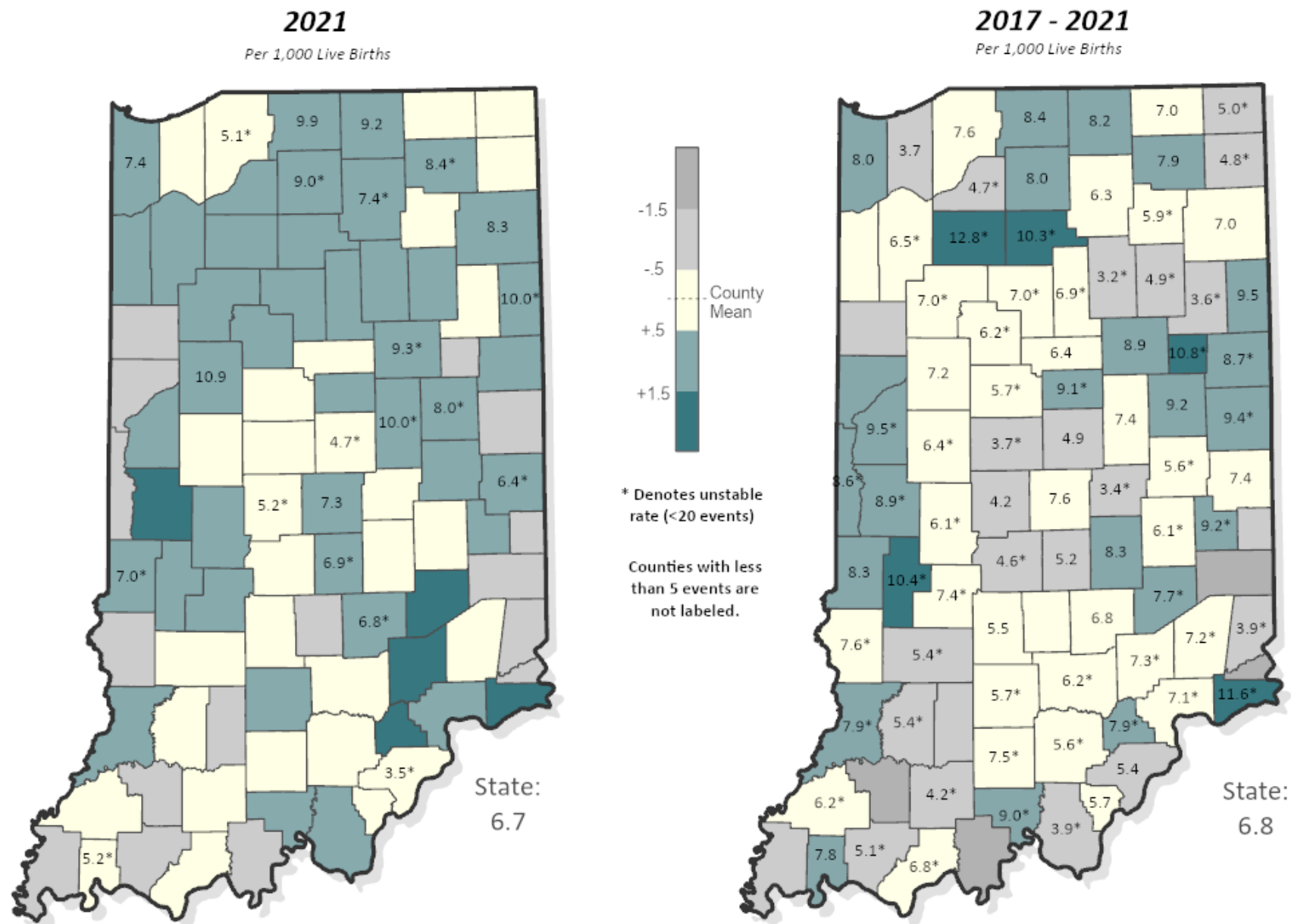
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Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [January 10, 2023]
Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

Infant Mortality by Region



Infant Mortality by County



County-Level Indiana Infant Mortality Rates

2017 – 2021

10 Highest Stable Infant Mortality Rates

Adams, 9.5	Delaware, 9.2	Grant, 8.9	St. Joseph, 8.4
Shelby, 8.3	Vigo, 8.3	Elkhart, 8.2	
Marshall, 8.0	Lake, 8.0	Noble, 7.9	

Stable Rates Achieving Healthy People 2020 Goal (IMR<6.0)

Porter, 3.7	Hendricks, 4.2	Hamilton, 4.9	Johnson, 5.2
Clark, 5.4	Monroe, 5.5	Floyd, 5.7	

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

Porter, 3.7	Hendricks, 4.2	Hamilton, 4.9
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County Infant Mortality Rates Compared to the State 2017 - 2021

Per 1,000 Live Births



Only counties with stable rates are marked 'High' or 'Low' (>=20 events between 2017-2021).

Highest Stable Infant Mortality Rates

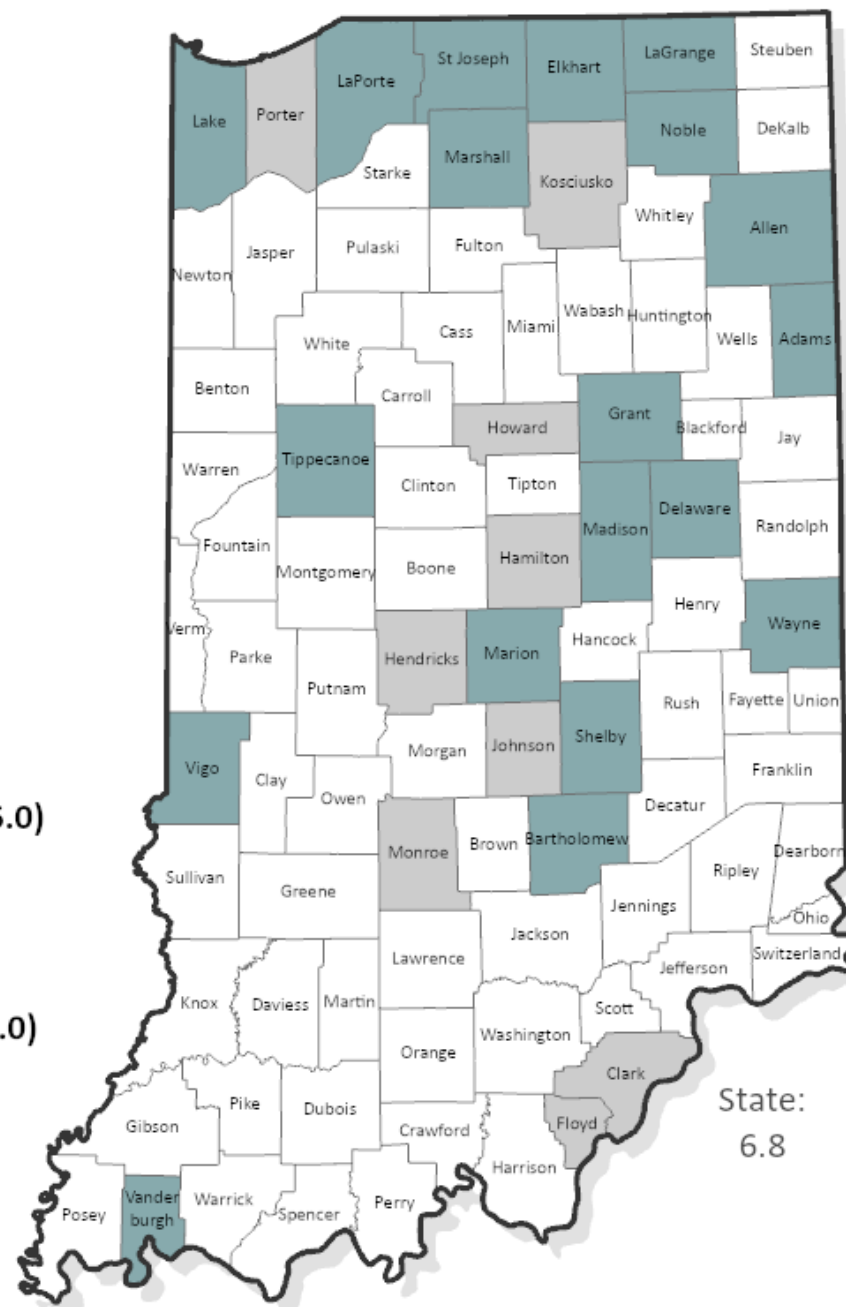
Adams, 9.5	Vigo, 8.3
Delaware, 9.2	Elkhart, 8.2
Grant, 8.9	Marshall, 8.0
St. Joseph, 8.4	Lake, 8.0
Shelby, 8.3	Noble, 7.9

Stable Rates Achieving Healthy People 2020 Goal (IMR<6.0)

Porter, 3.7	Clark, 5.4
Hendricks, 4.2	Monroe, 5.5
Hamilton, 4.9	Floyd, 5.7
Johnson, 5.2	

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

Porter, 3.7
Hendricks, 4.2
Hamilton, 4.9



County-Level Rates by Race/Ethnicity

2017 – 2021

Stable NH Black Infant Mortality Rates

Elkhart, 22.7	Vanderburgh, 19.1	Tippecanoe, 16.5	Allen, 15.5
St. Joseph, 15.2	Lake, 13.7	Marion, 11.1	

Stable NH White Infant Mortality Rates*

Adams, 10.3	Shelby, 9.2	Grant, 8.0	Delaware, 7.7
Noble, 7.6	Vigo, 7.4	Wayne, 7.4	

Stable Hispanic Infant Mortality Rates

Elkhart, 8.3	Allen, 8.1	Lake, 7.9	Marion, 6.1
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NH = Non-Hispanic

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

* Stable rates are only shown if they are above the state average of 6.8 for 2017-2021.

Highest Infant Mortality Rates by ZIP Code

2017-2021

Zip Code	County	Births	Deaths	IMR	NH White IMR	NH Black IMR	Hispanic IMR
→ 46516	Elkhart	2780	38	13.7	8.0*	38.0	8.3*
→ 46218	Marion	2481	30	12.1	U	14.7	U
46628	St. Joseph	2017	24	11.9	6.5*	19.1*	U
46241	Marion	2587	30	11.6	11.3*	16.0*	8.3*
46219	Marion	2385	27	11.3	7.2*	19.5*	12.3*
46514	Elkhart	2786	30	10.8	9.0*	22.0*	12.3*
→ 46806	Allen	2425	26	10.7	16.3*	15.3*	U
→ 46312	Lake	1970	21	10.7	U	18.0*	6.0*
46410	Lake	2160	23	10.6	U	13.7*	12.4*
46222	Marion	3056	29	9.5	U	18.9	4.8*
46201	Marion	2577	24	9.3	9.3*	13.1*	U
46224	Marion	3598	31	8.6	U	8.0*	8.7*
46235	Marion	3305	28	8.5	U	9.7*	6.2*

*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.

NH = Non-Hispanic
Added to the table this year.

→ On the list in 2014-2018, 2015-2019, 2016-2020, and 2017-2021.

Highest Infant Mortality Rates by ZIP Code

2017-2021



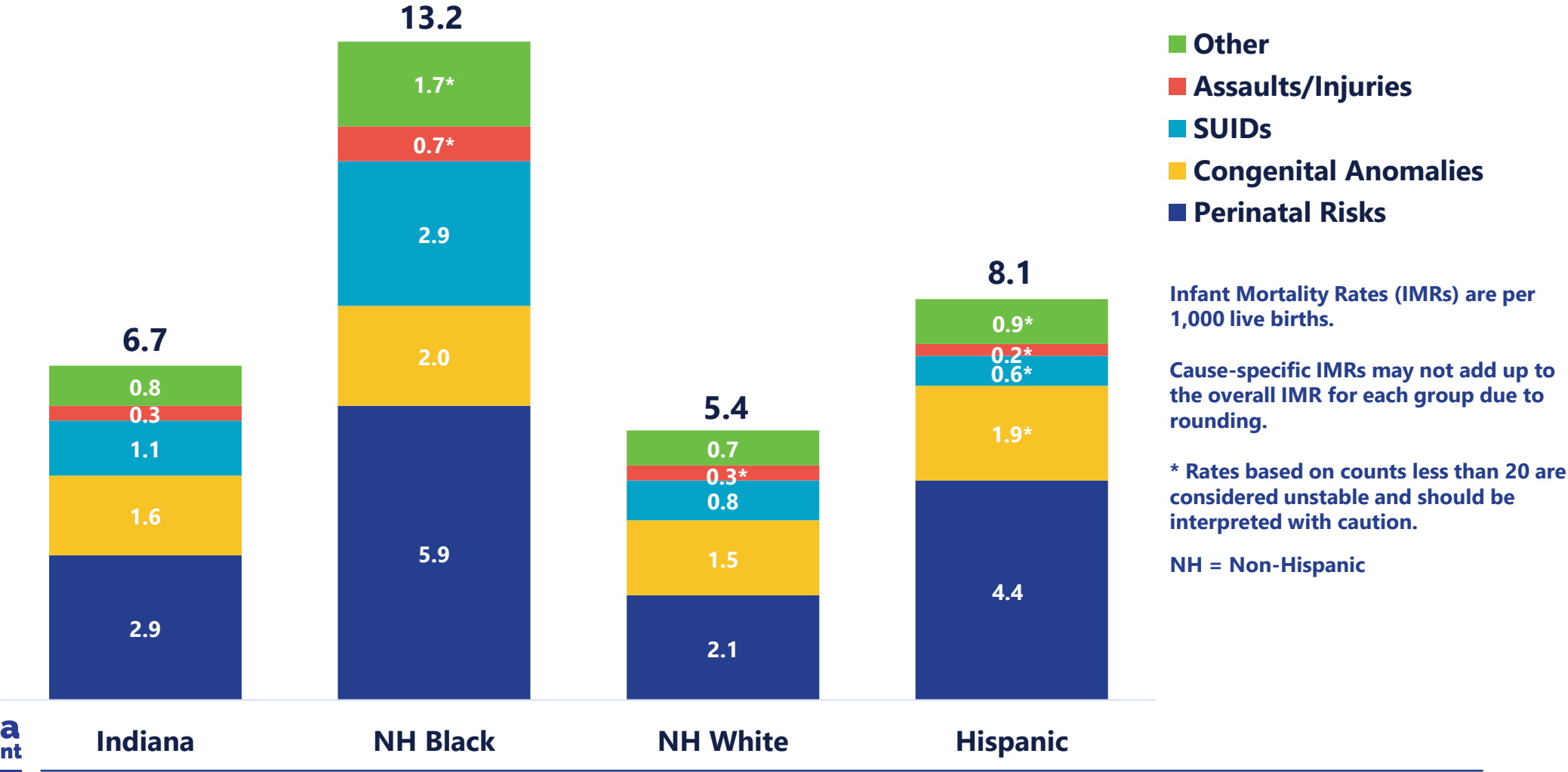
■ Indicates ZIP Code

Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 6, 2023]
Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

Cause-Specific Infant Mortality

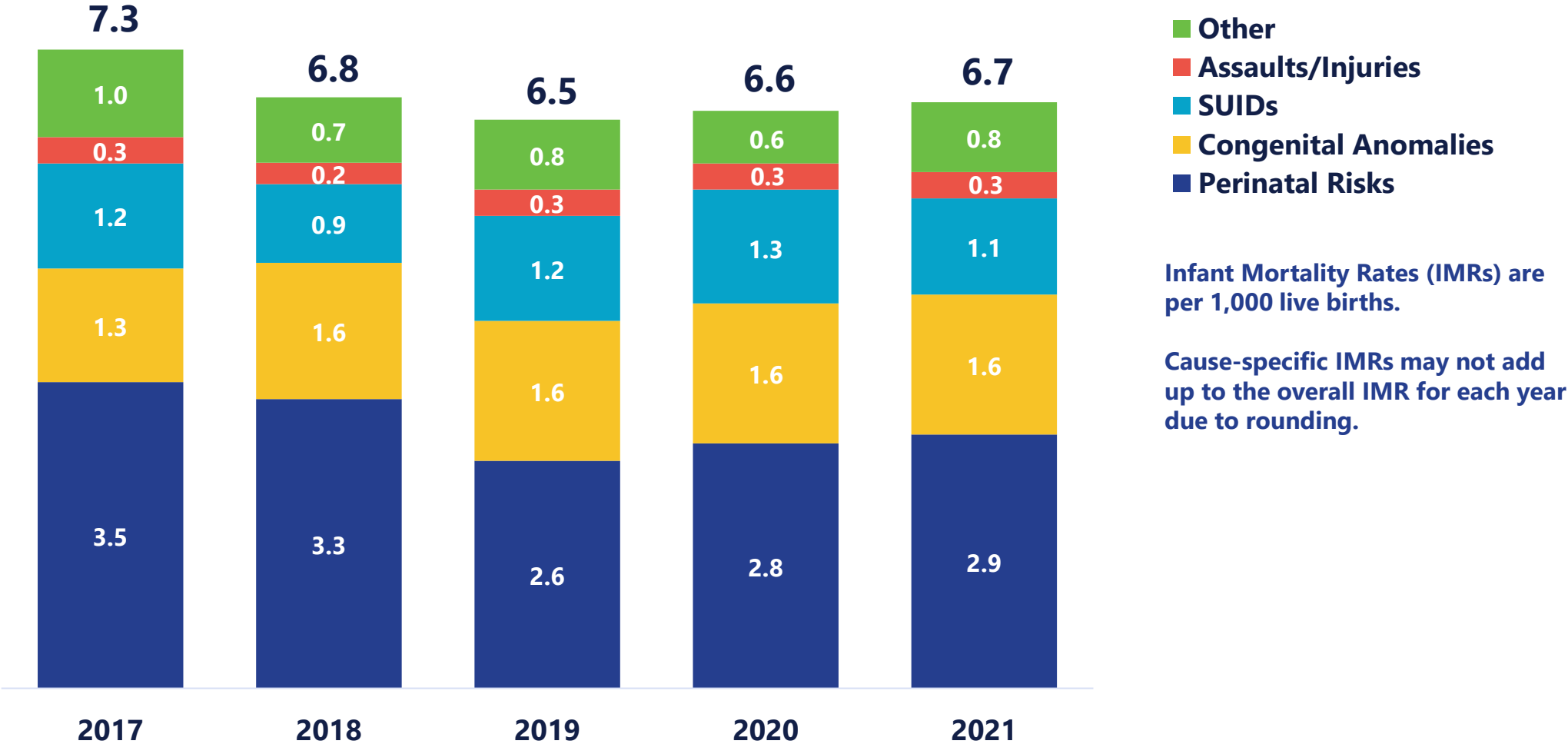


2021 Cause-Specific IMR by Race/Ethnicity



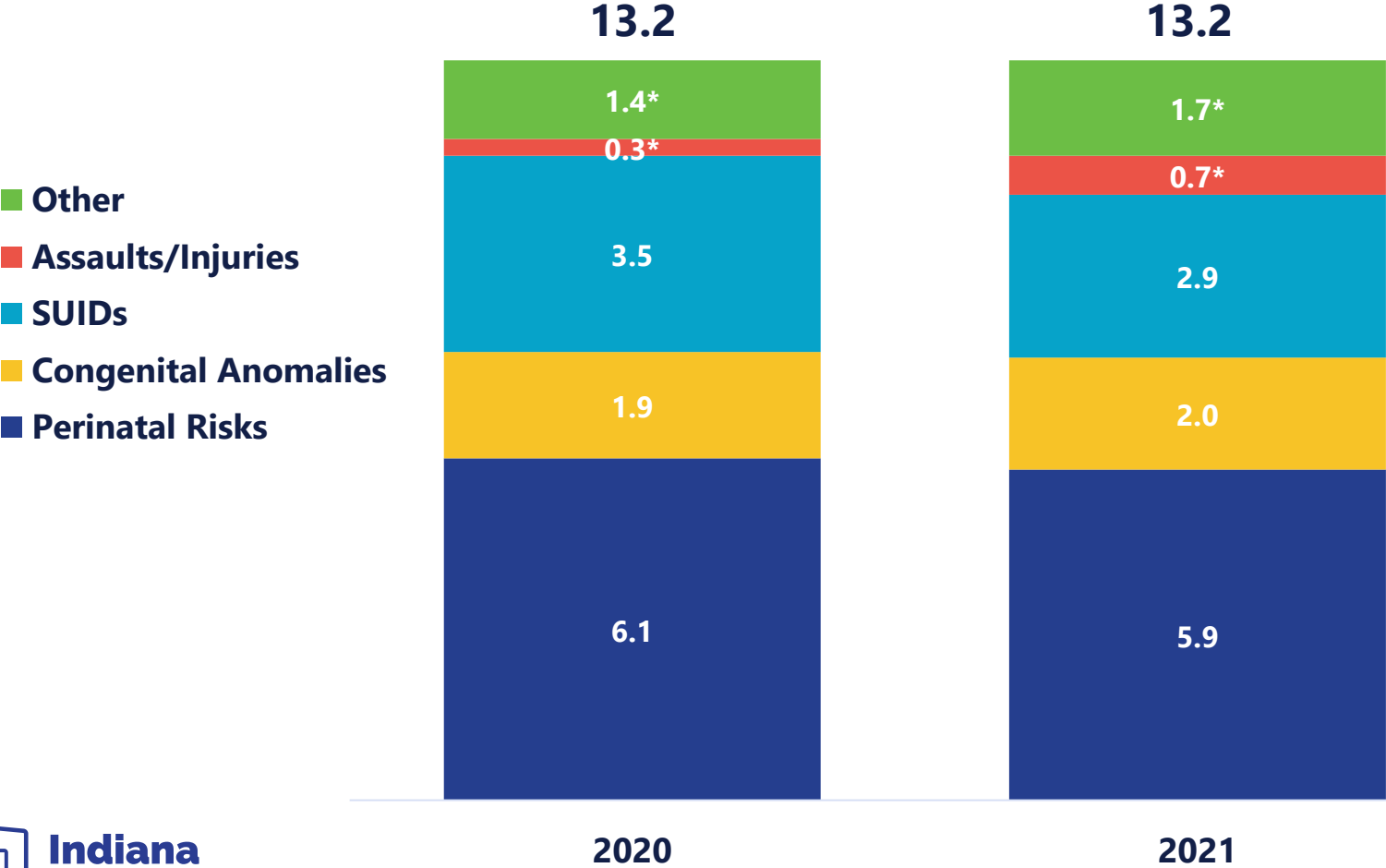
Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [January 9, 2023]
Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

Causes of Indiana Infant Mortality



Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [January 9, 2023]
Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

Causes of Indiana NH Black Infant Mortality



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

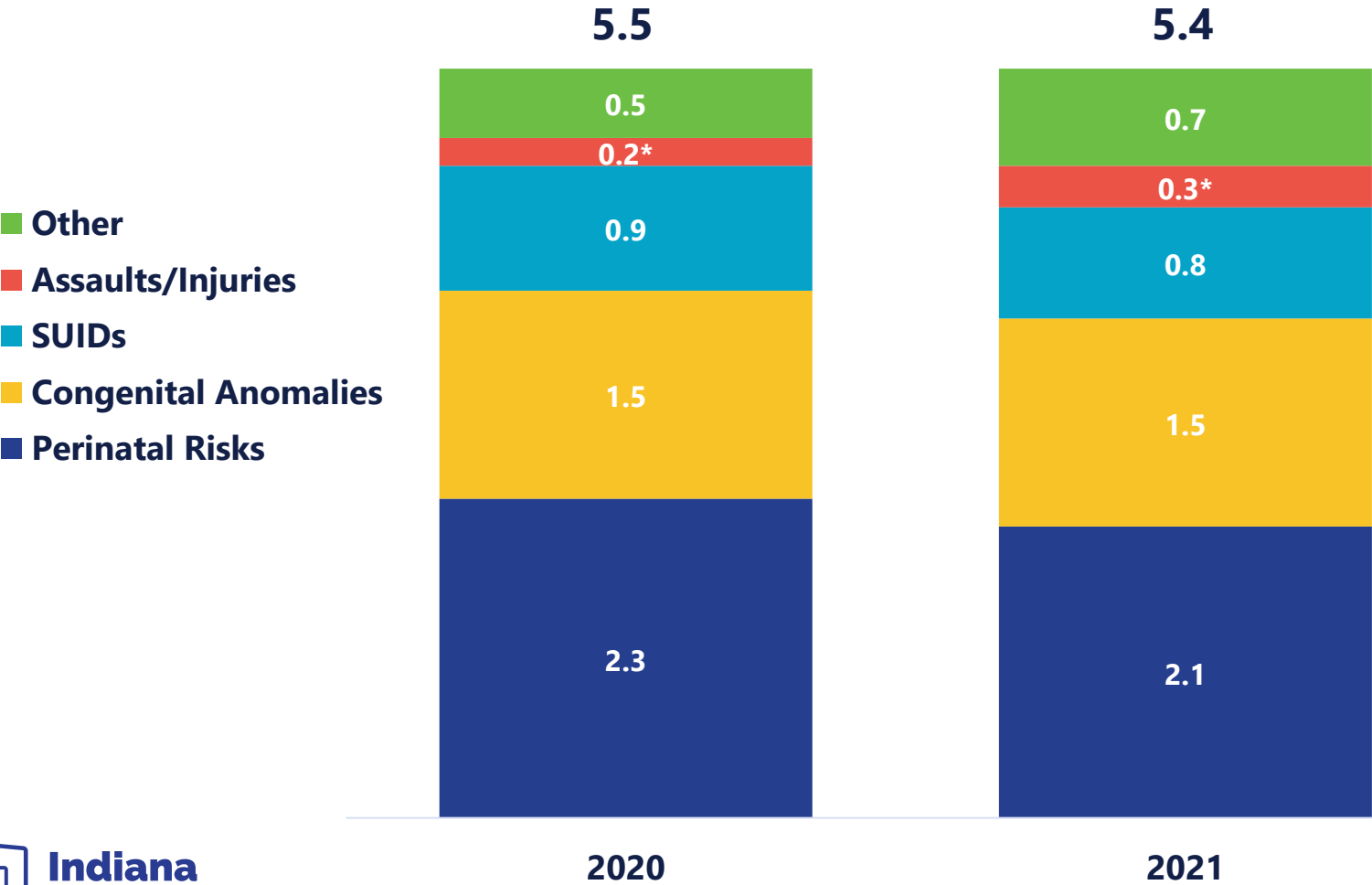
Cause-specific IMRs may not add up to the overall IMR for each year due to rounding.

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

NH = Non-Hispanic



Causes of Indiana NH White Infant Mortality



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

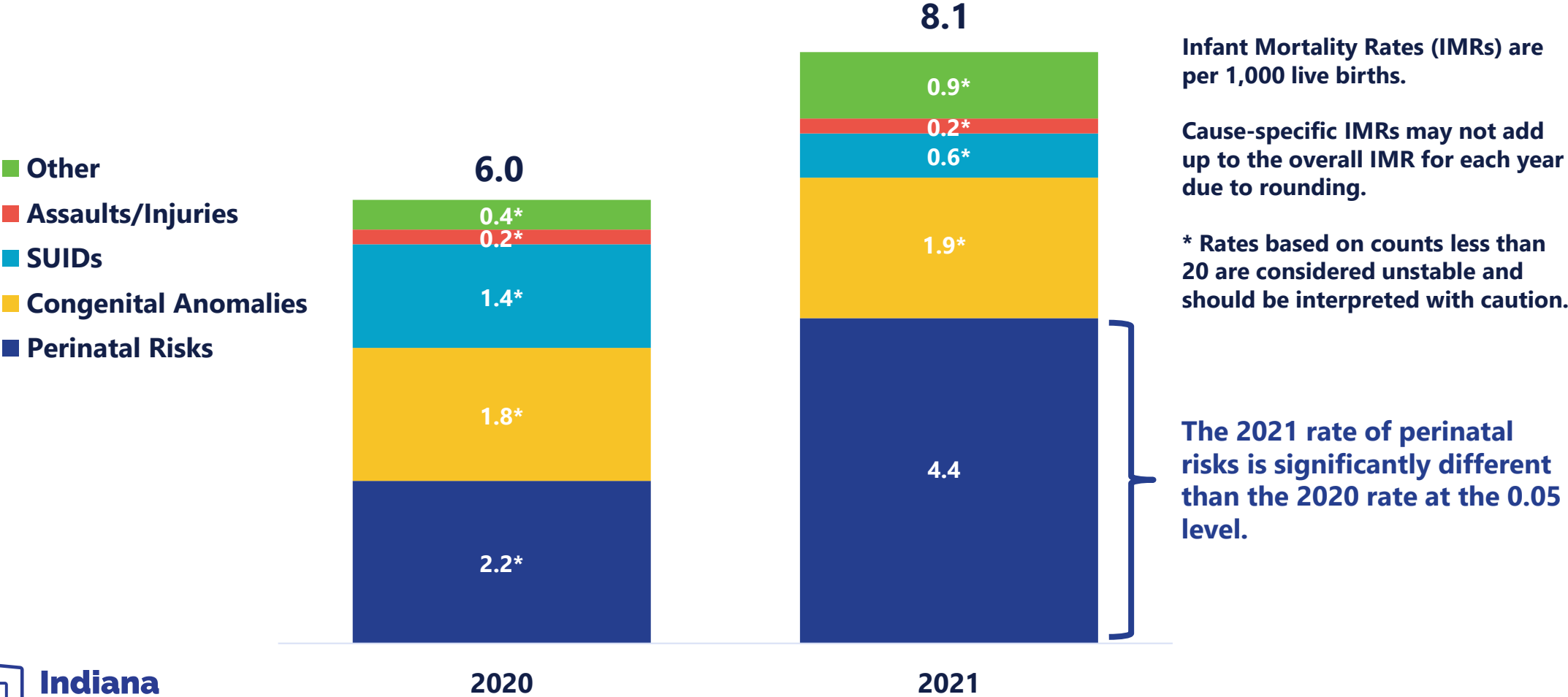
Cause-specific IMRs may not add up to the overall IMR for each year due to rounding.

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

NH = Non-Hispanic

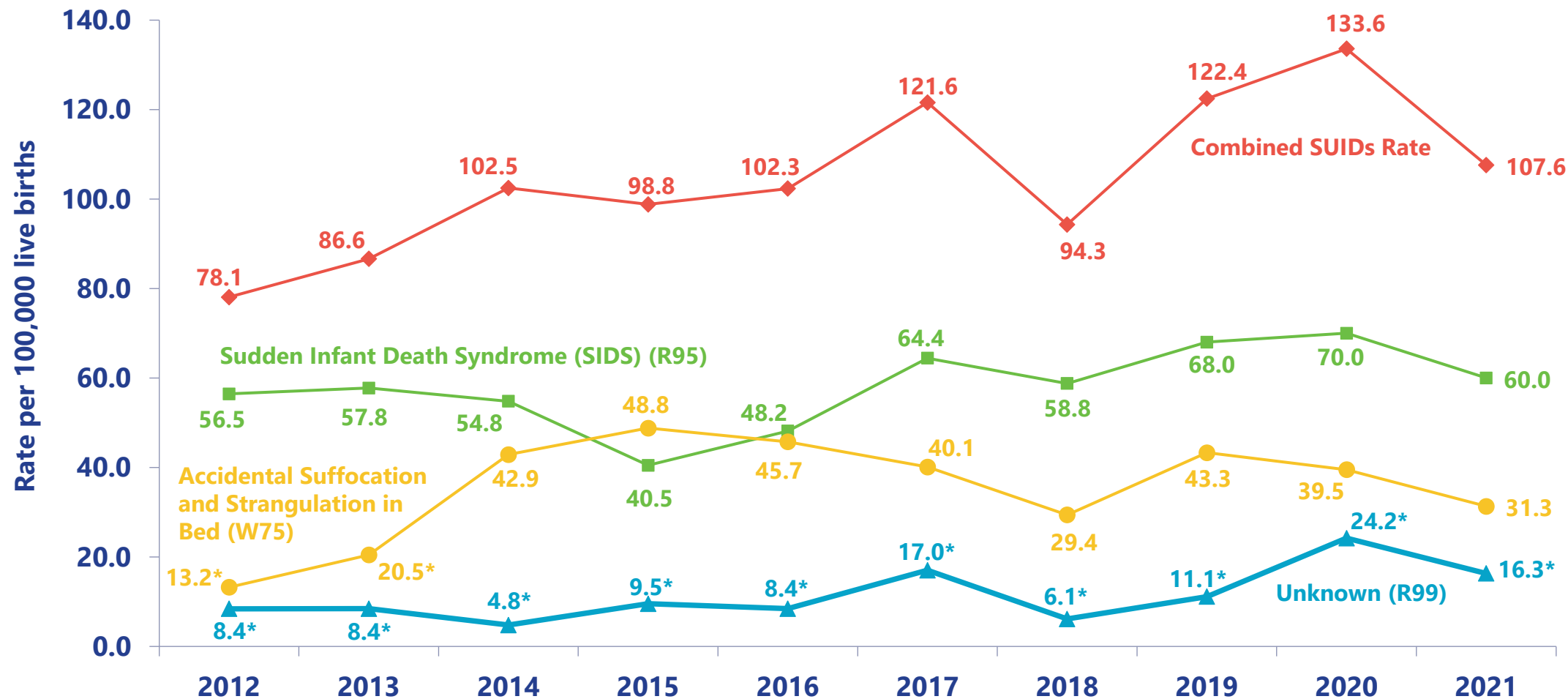


Causes of Indiana Hispanic Infant Mortality



SUIDs Rates by Cause

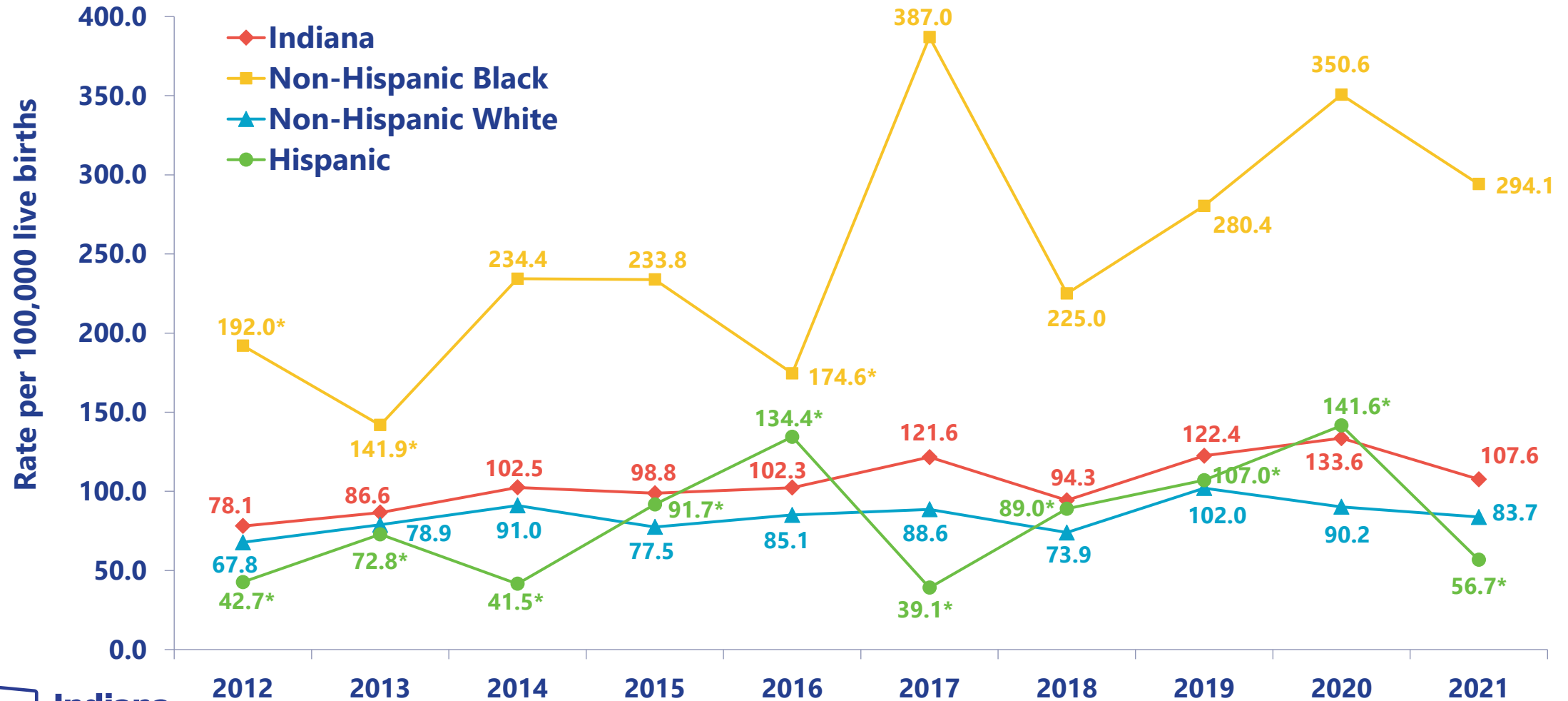
Indiana, 2012-2021



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

SUIDs Rates by Race & Ethnicity

Indiana, 2012-2021



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



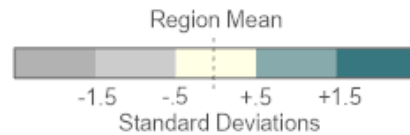
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SUIDs = W75, R95, R99

Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [January 9, 2023]
Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

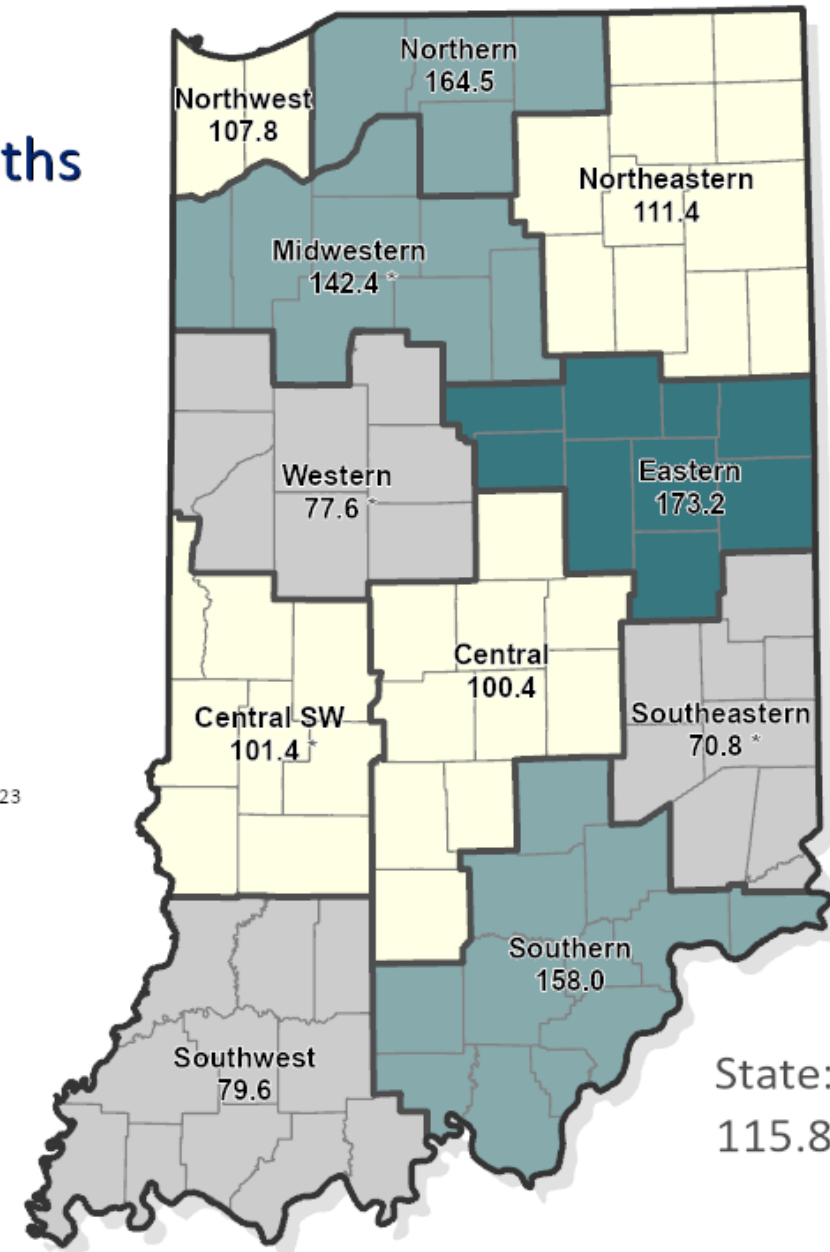
Sudden Unexpected Infant Deaths By Hospital Region 2017 - 2021

Per 100,000 Live Births



*** Denotes unstable rate (<20 events)**

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2023



Infant Mortality by Age

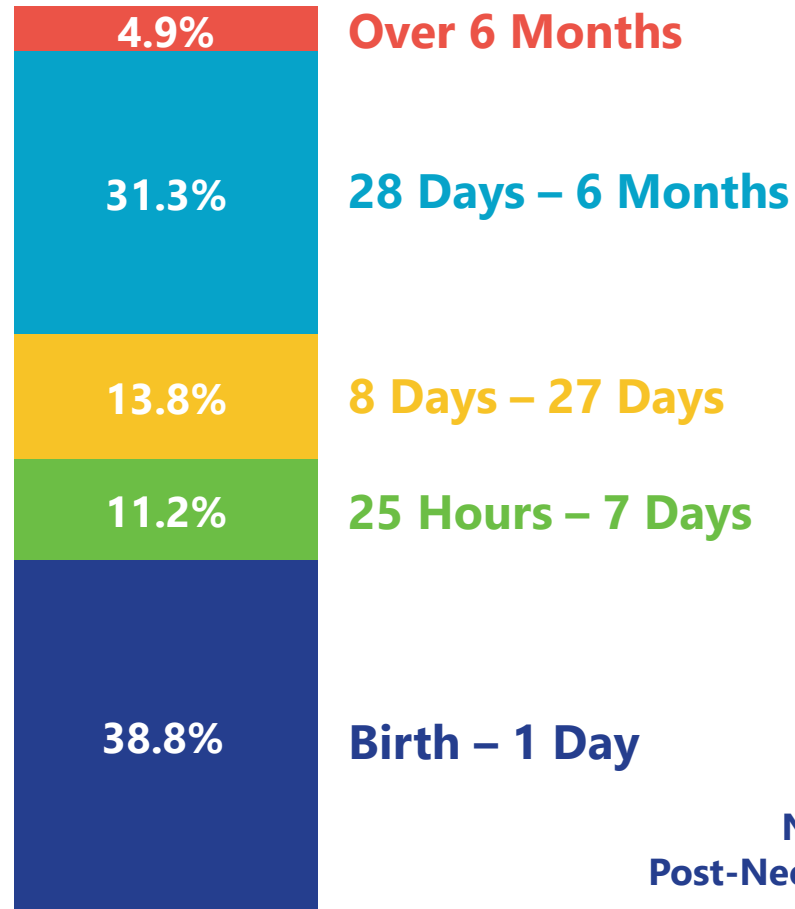


2021 Infant Deaths by Age of the Baby

N = 536
Total Neonatal = 342
Total Post-Neonatal = 194

63.8%

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



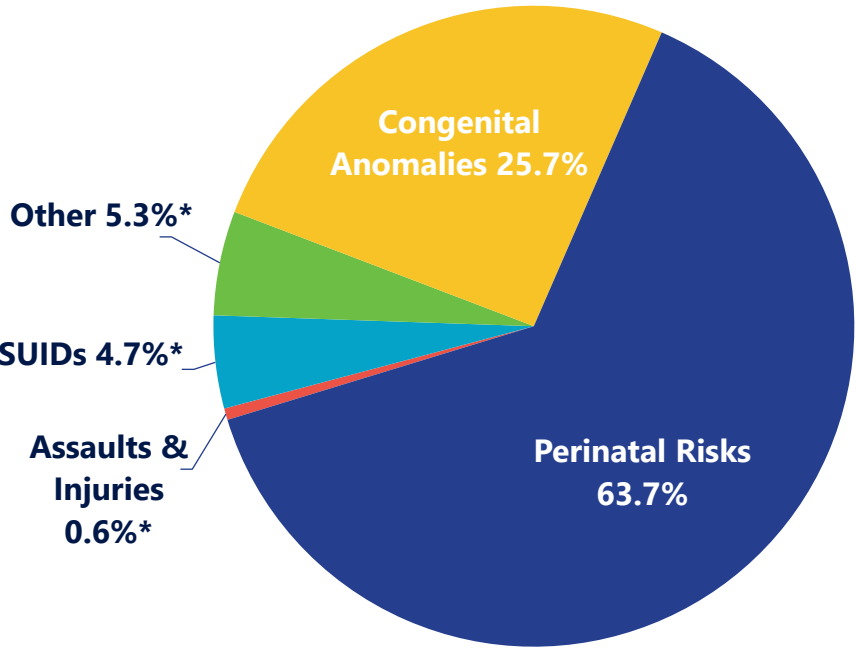
Neonatal = 0-27 days
Post-Neonatal = 28-364 days

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

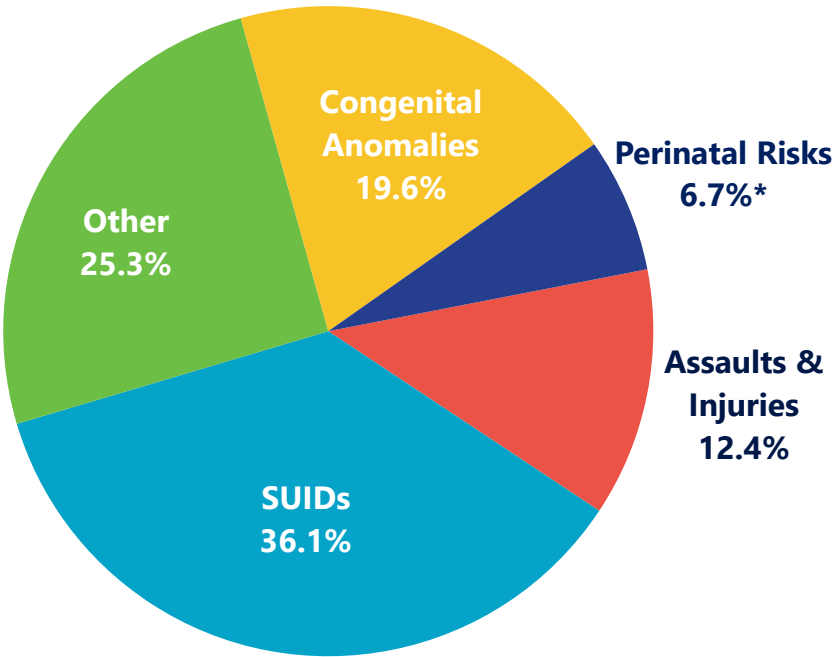
Causes of Infant Mortality by Age

Indiana 2021

Neonatal



Post - Neonatal

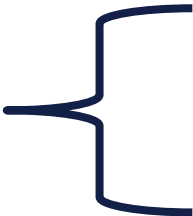


* Percentages based on counts less than 20 are considered unstable and should be interpreted with caution.

2021 SUIDs by Age of the Baby

Over 1/4

of Indiana SUIDs
occurred between
1 and 2 months



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

Contributing Factors to Infant Mortality



Factors Contributing to Infant Mortality, Indiana 2021

- **Obesity**

- Indiana ranks 5th highest in the U.S. for percentage of adults who have obesity (36.8% of adults)
- 35.0% of Indiana births in 2021 were to pregnant persons who have obesity (additional 26.1% overweight)
- Pregnant persons 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**

- 9.8% of births exposed to smoking during pregnancy
- 18.2% of births to individuals on Medicaid were exposed to smoking during pregnancy while 4.2% of births to individuals not on Medicaid were exposed to smoking

- **Limited Prenatal Care**

- 28.3% of births were to persons not receiving prenatal care during the 1st trimester (a statistically significant decrease compared to 2020)

- **Unsafe Sleep Practices**

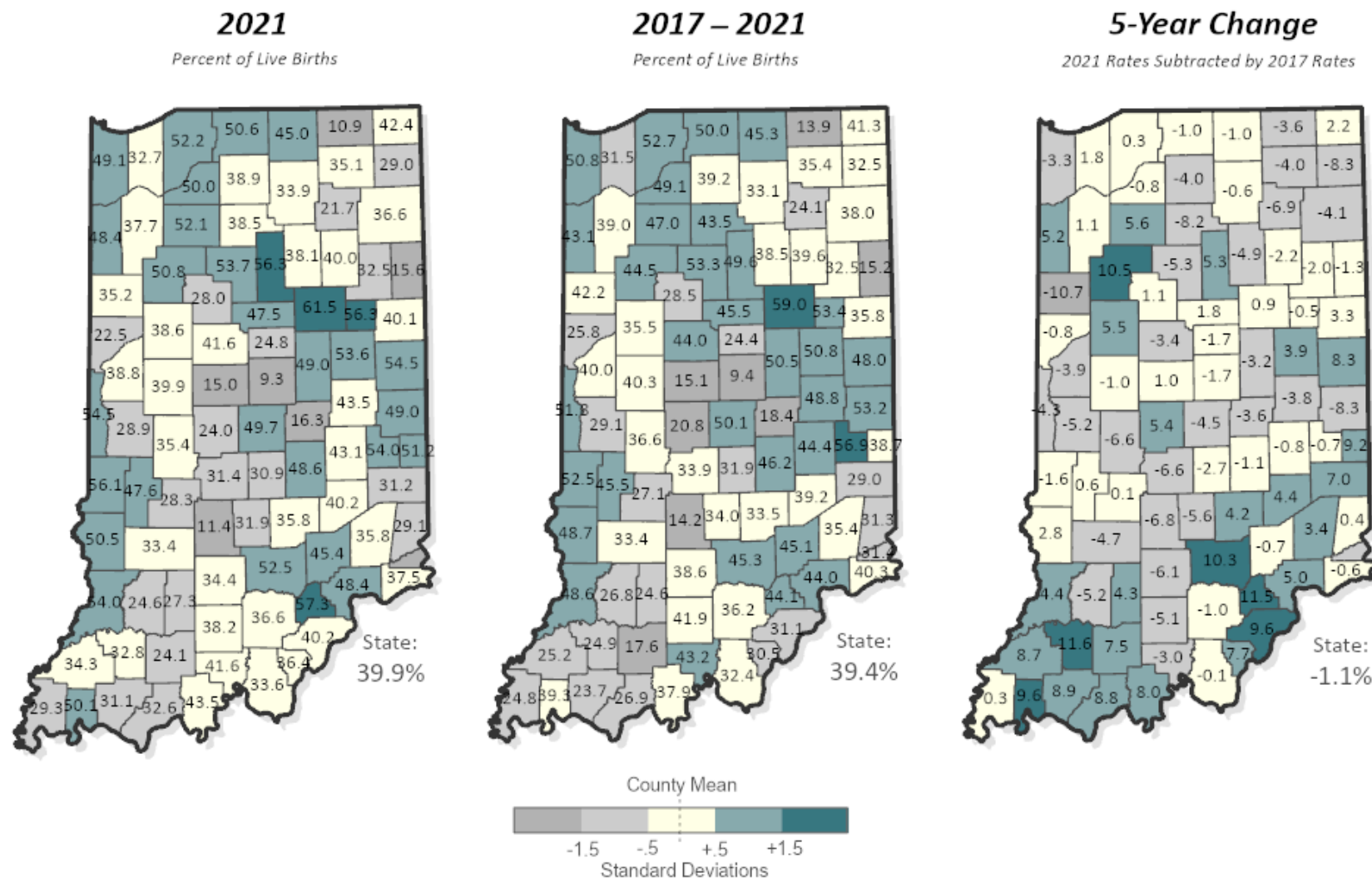
- 16.0% of infant deaths in 2021 can be attributed to SUIDs

Self-Reported Demographics

Indiana 2021

- **Average Age** = 28 years (Range: 12 - 53)
- **Education**
 - 14.1% have less than a high school diploma.
 - 29.1% have a high school diploma or GED.
 - 18.2% have some college education, but no degree.
 - 38.4% have an associate's degree or higher.
- **Income** – 39.9% of births to persons on Medicaid.
 - Medicaid reports ~ 46.9%
- **Marital Status** – 55.7% to married parents

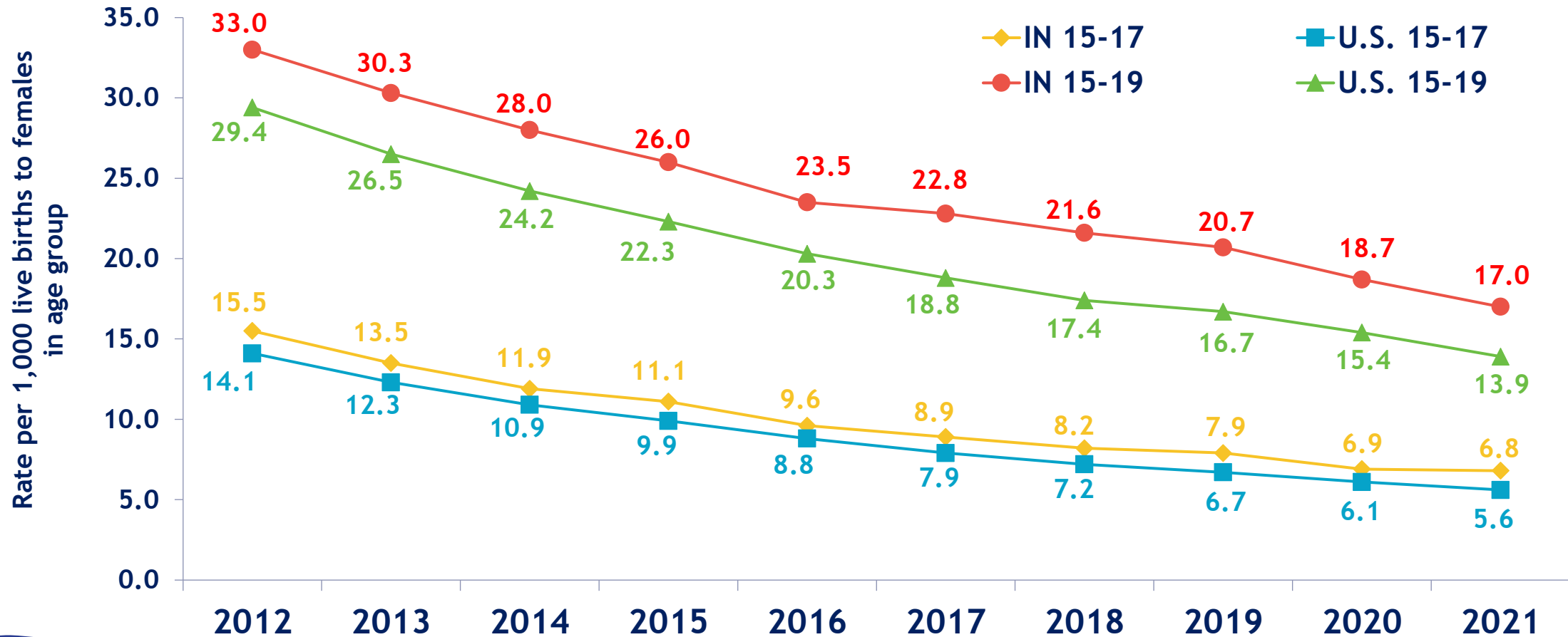
Births to Persons on Medicaid



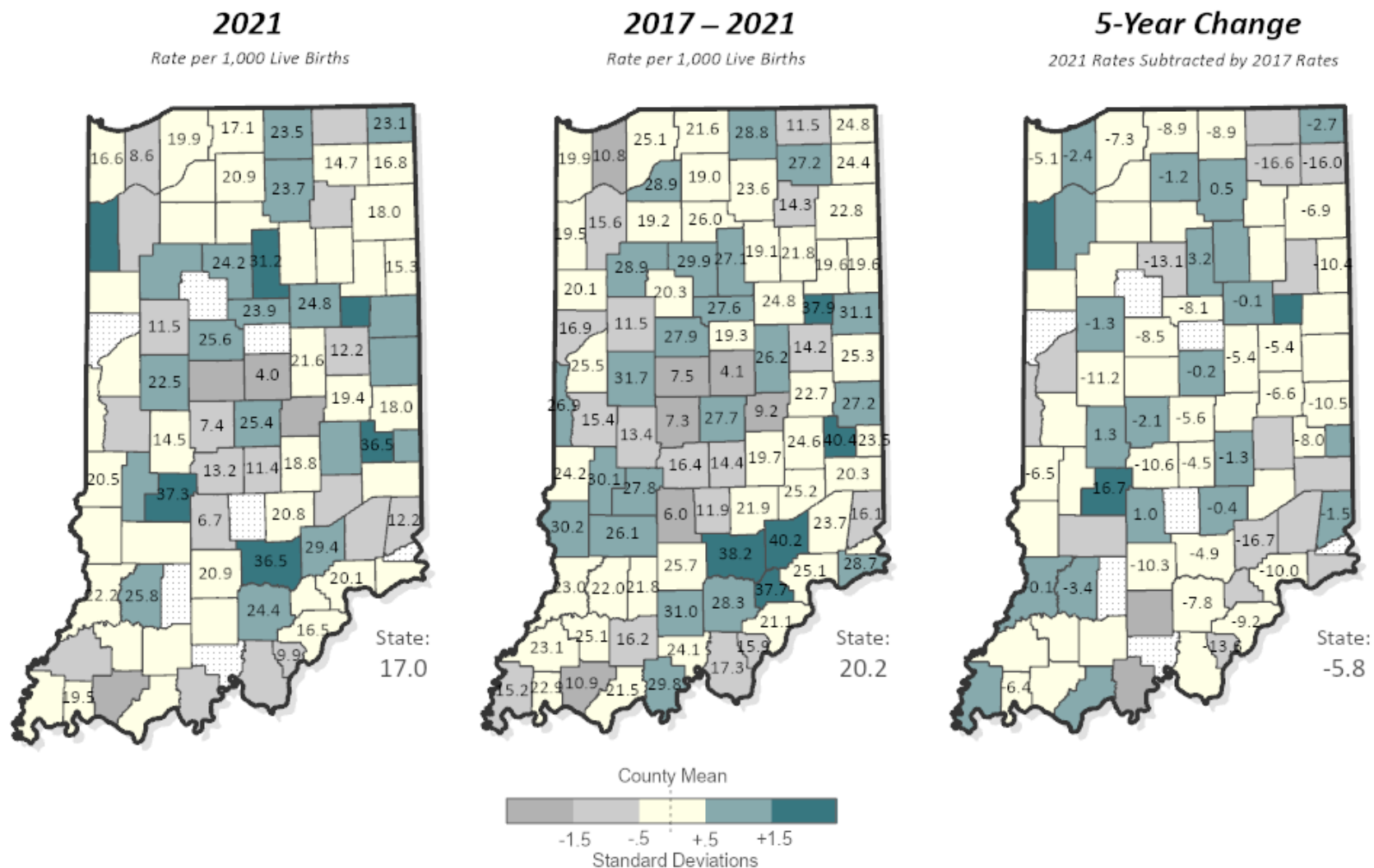
Only stable county percentages are labeled (≥ 20 events). Counties with less than 5 events are suppressed.

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2023

Age-Specific Birth Rates for Teens, Indiana and U.S., 2012-2021



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 2023

Birth Outcomes



Indiana Birth Outcomes

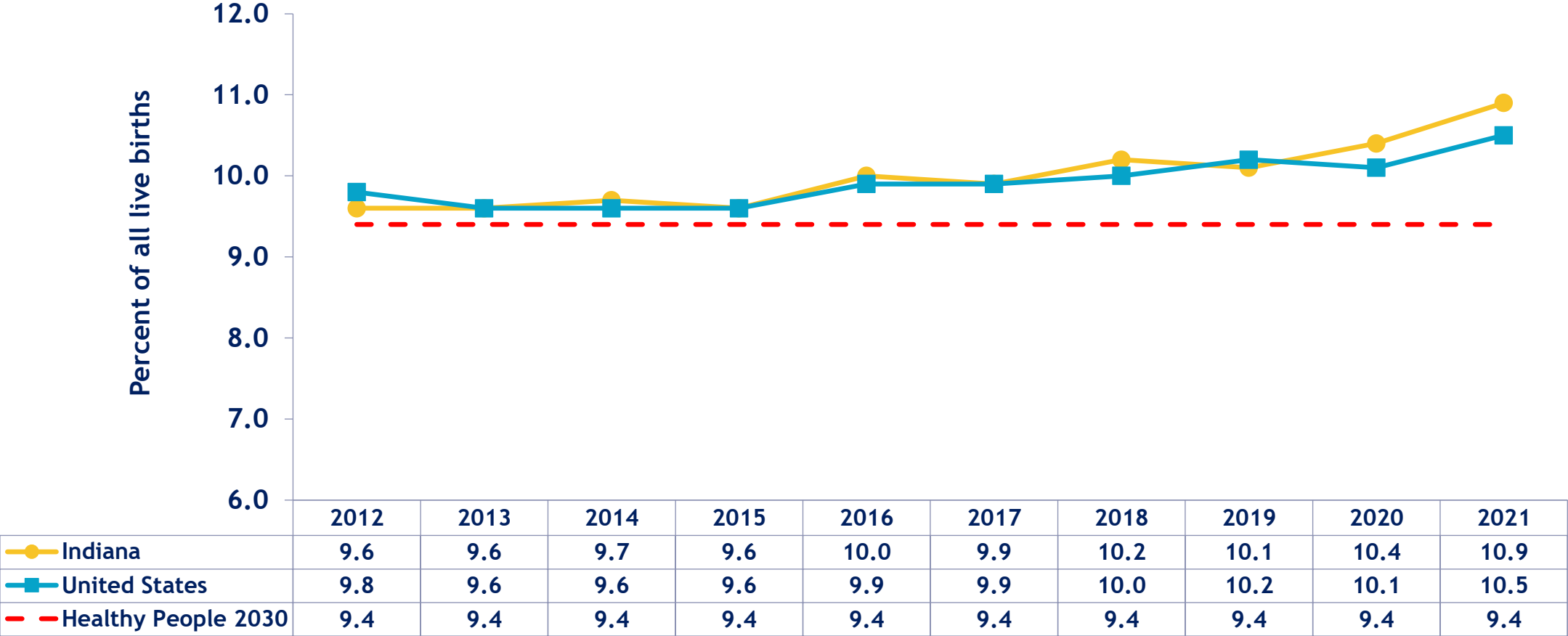
Measure	2020	2021
Preterm (< 37 weeks gestation)	10.4%	10.9%
Low Birthweight (< 2500 g)	8.1%	8.4%
Very Low Birthweight (< 1500 g)	1.4%	1.3%
Not Breastfeeding (at discharge)	18.0%	18.6%
No Early Prenatal Care (1 st Trimester)	30.7%	28.3%
Mothers on Medicaid	38.5%	39.9%
Teen Pregnancy	5.3%	4.9%

2021 Birth Outcomes by Race/Ethnicity

Measure	Indiana	Non-Hispanic Black	Non-Hispanic White	Hispanic
Preterm (< 37 weeks gestation)	10.9%	14.1%	10.4%	10.7%
Low Birthweight (< 2500 g)	8.4%	14.1%	7.3%	8.2%
Very Low Birthweight (< 1500 g)	1.3%	2.5%	1.1%	1.5%
Not Breastfeeding (at discharge)	18.6%	26.1%	17.9%	14.8%
No Early Prenatal Care (1 st Trimester)	28.3%	39.5%	23.9%	41.2%
Mothers on Medicaid	39.9%	63.7%	31.4%	65.3%
Teen Pregnancy	4.9%	7.9%	3.9%	8.2%

% Preterm (Obstetric Estimate < 37 weeks)

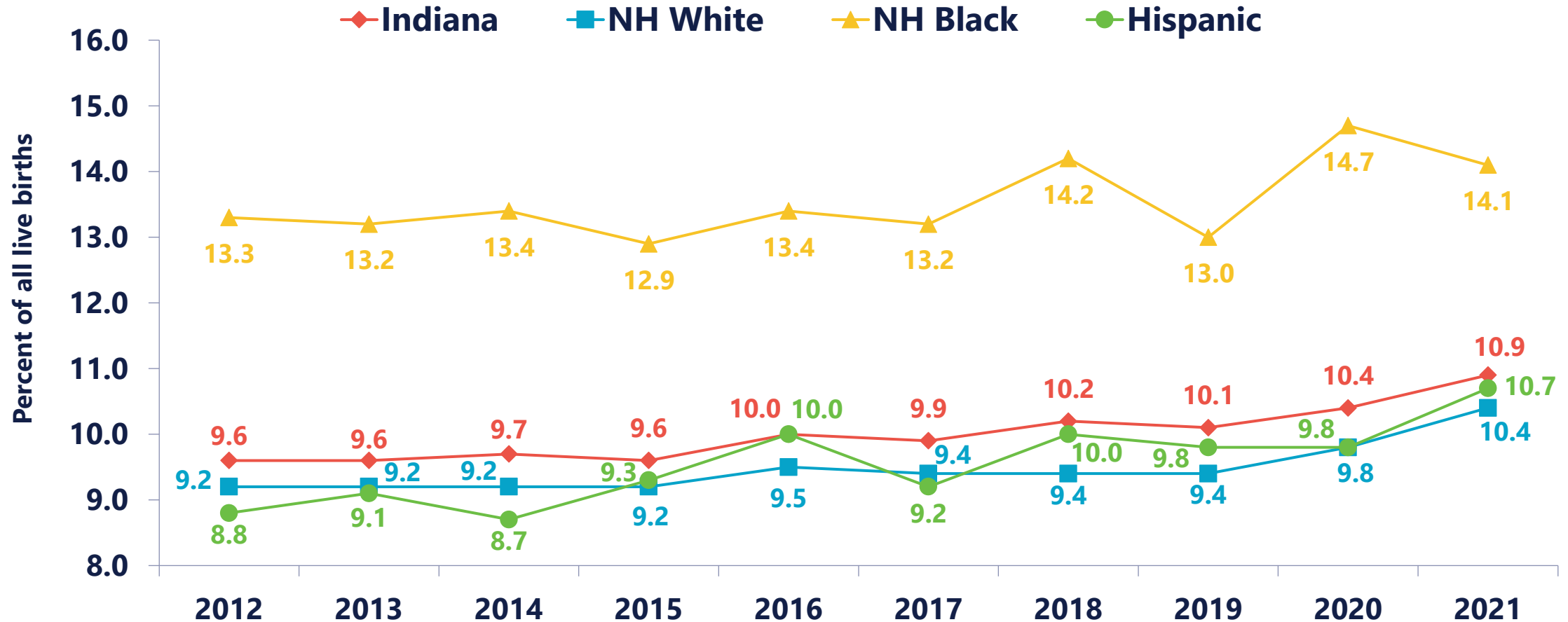
Indiana, U.S. and Healthy People Goals, 2012-2021



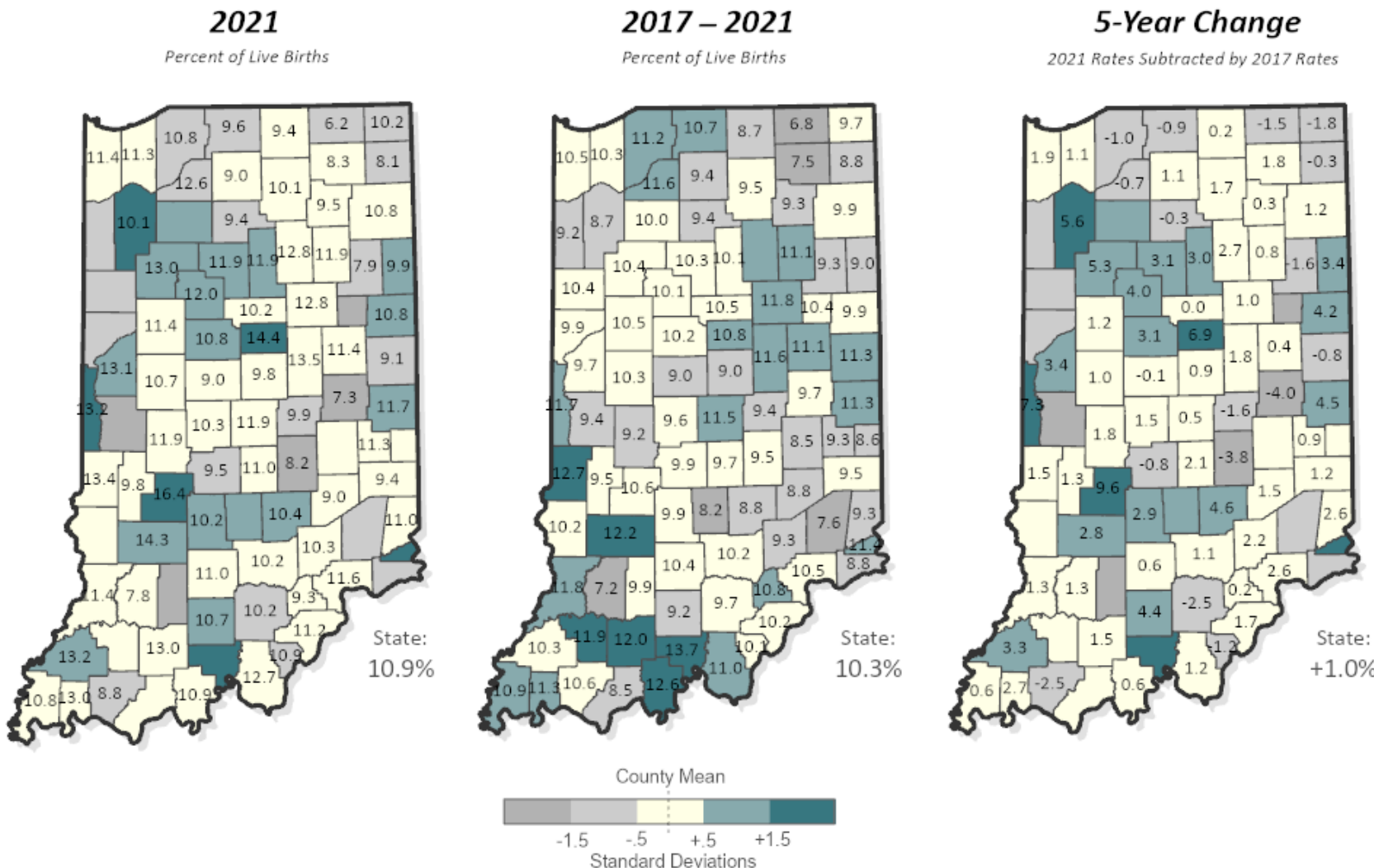
Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [February 3, 2023]
United States Original: Centers for Disease Control and Prevention National Center for Health Statistics
Indiana Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

% Preterm (Obstetric Estimate < 37 weeks)

Indiana by Race and Ethnicity, 2012-2021



Preterm Births

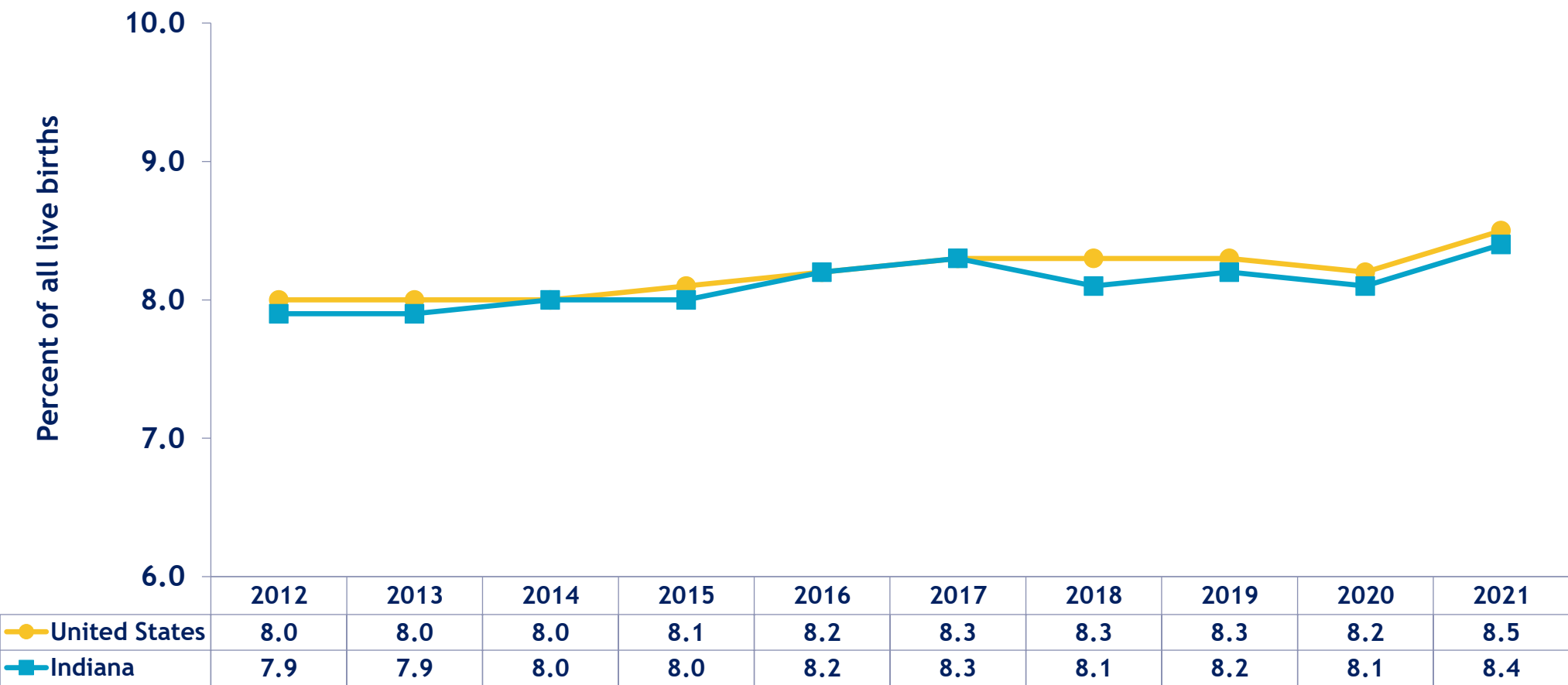


Only stable county percentages are labeled (≥ 20 events). Counties with less than 5 events are suppressed.

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2023

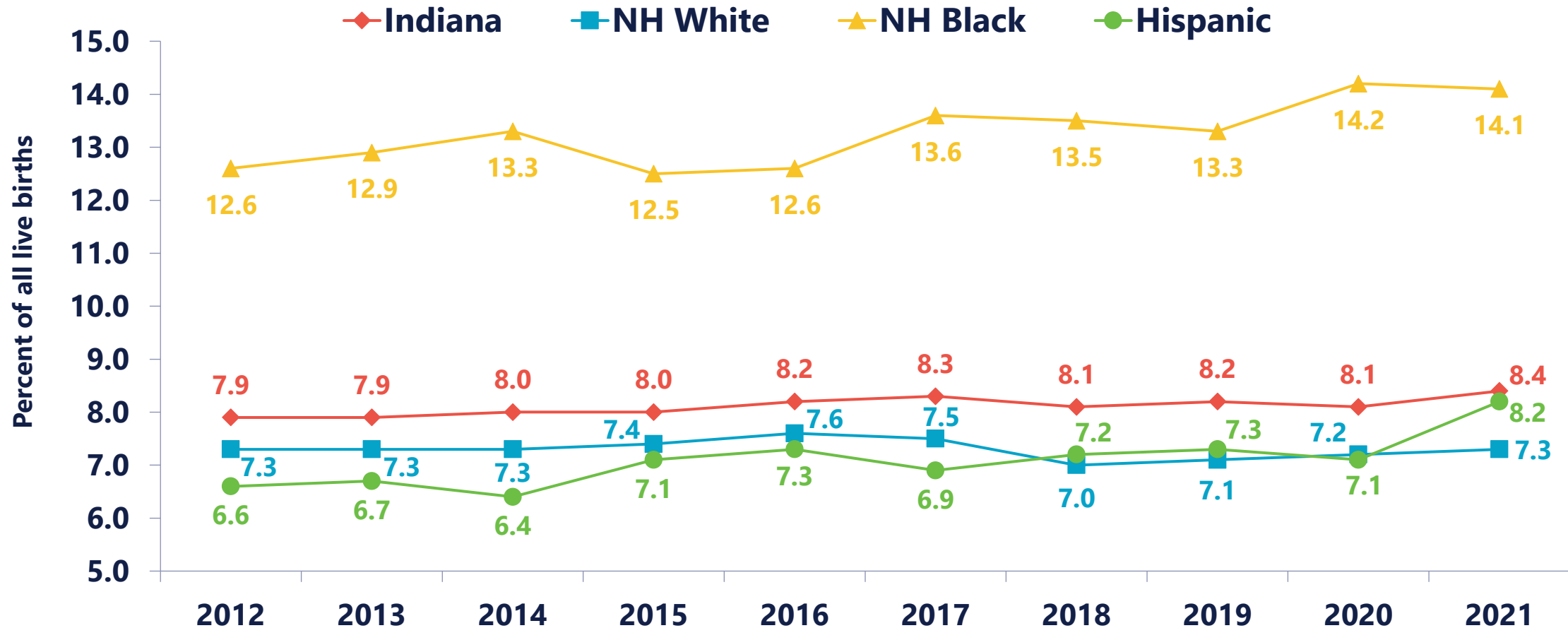
% Low Birthweight (< 2,500 grams)

Indiana, U.S. and Healthy People Goal, 2012-2021

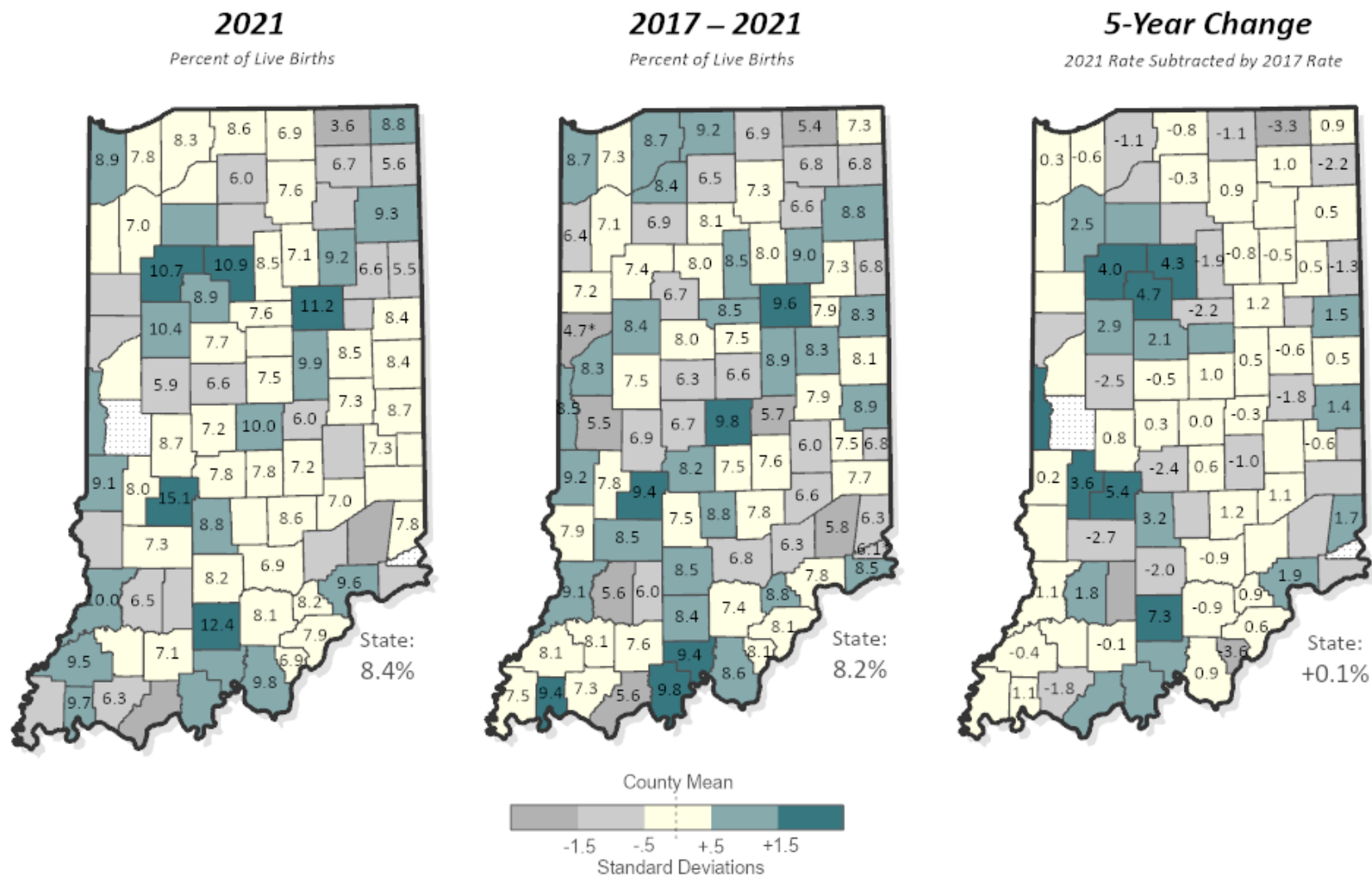


% Low Birthweight (< 2,500 grams)

Indiana by Race and Ethnicity, 2012-2021



Low Birth Weight Births

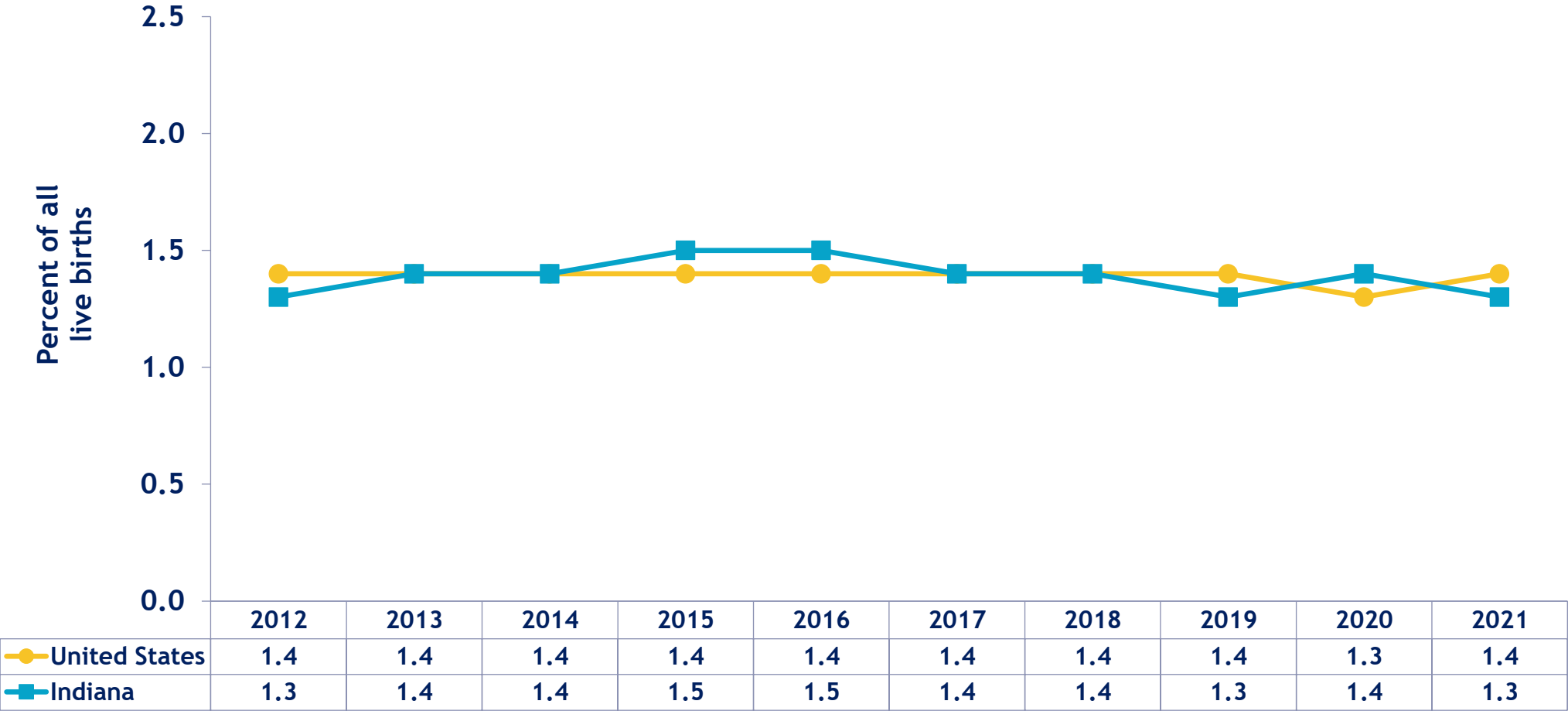


Only stable county percentages are labeled (≥ 20 events). Counties with less than 5 events are suppressed.

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, 12.16.21

% Very Low Birthweight (< 1,500 grams)

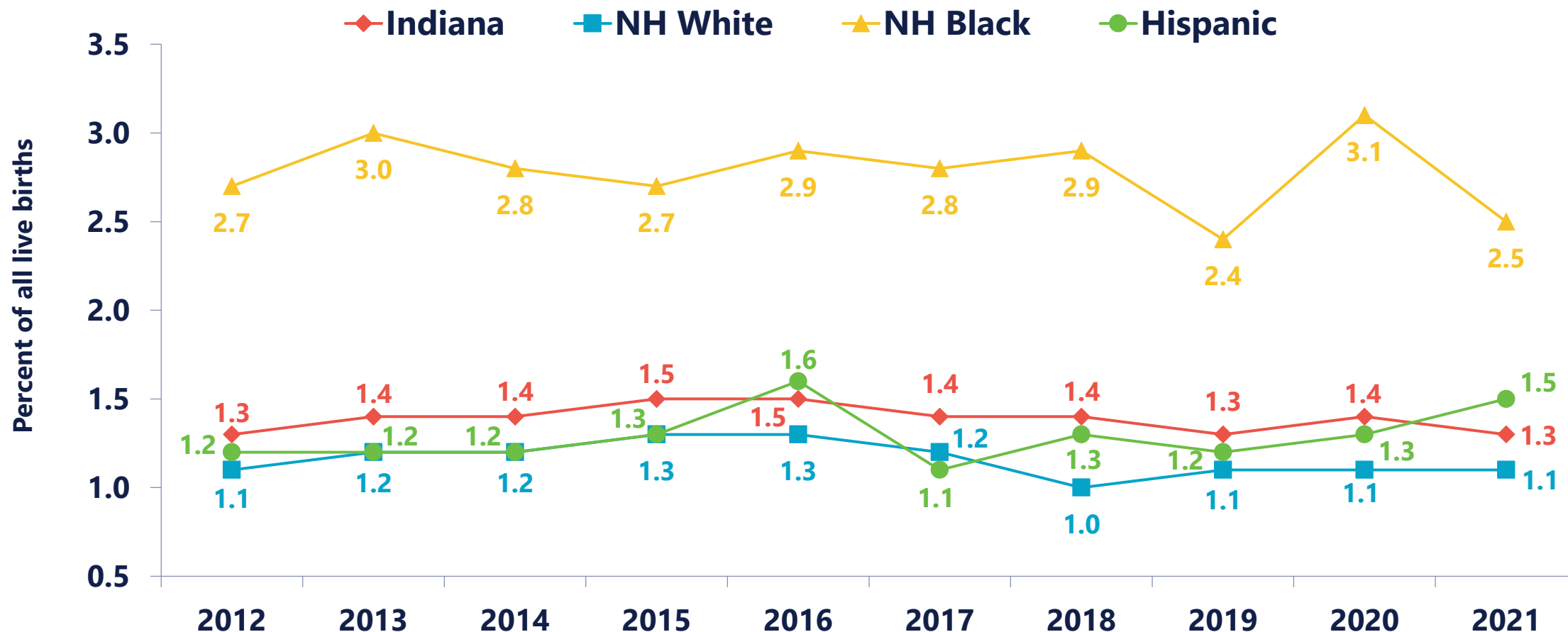
Indiana, U.S. and Healthy People Goal, 2012-2021



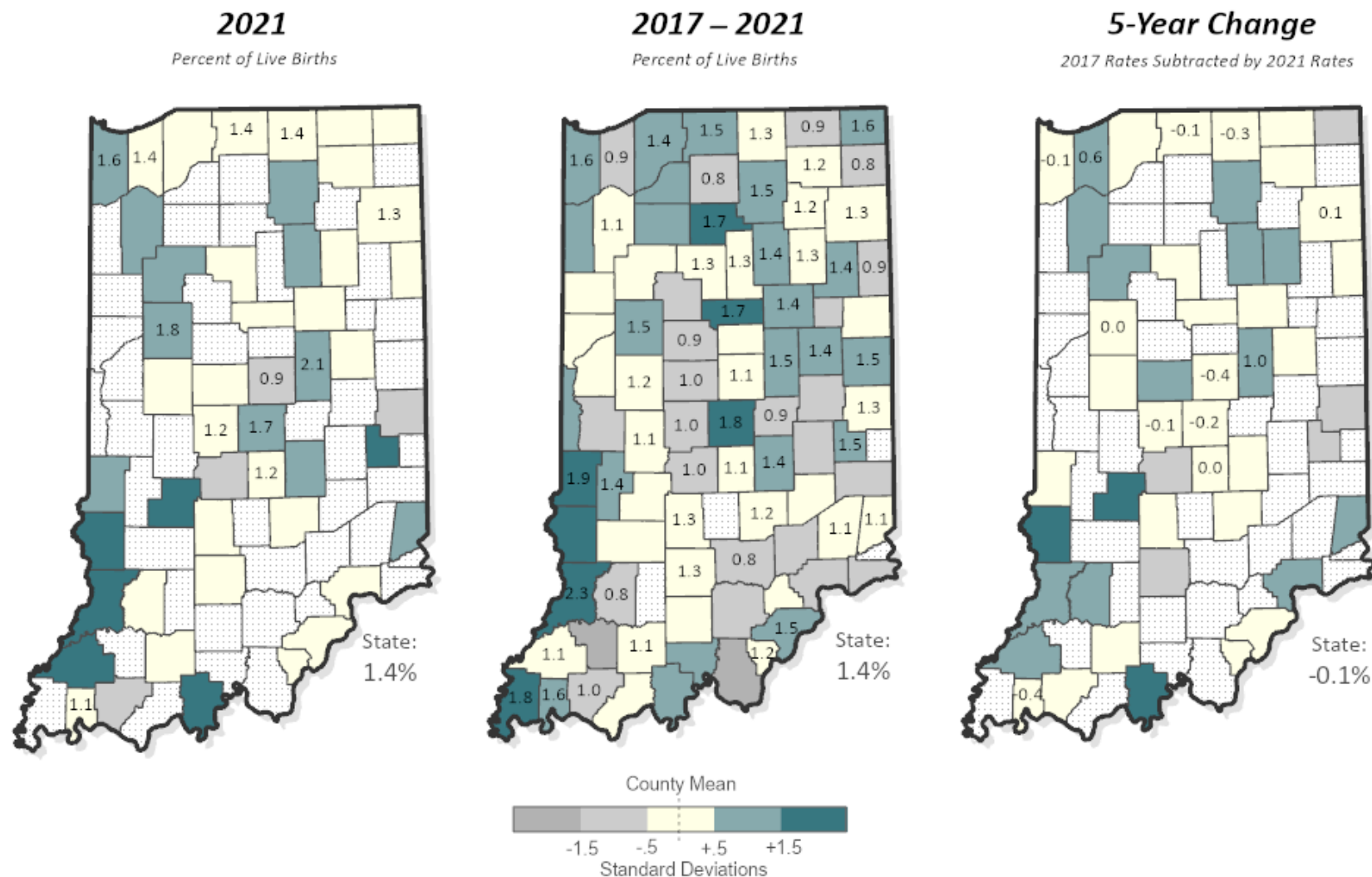
Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [February 6, 2023]
United States Original: Centers for Disease Control and Prevention National Center for Health Statistics
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% Very Low Birthweight (< 1,500 grams)

Indiana by Race and Ethnicity, 2012-2021



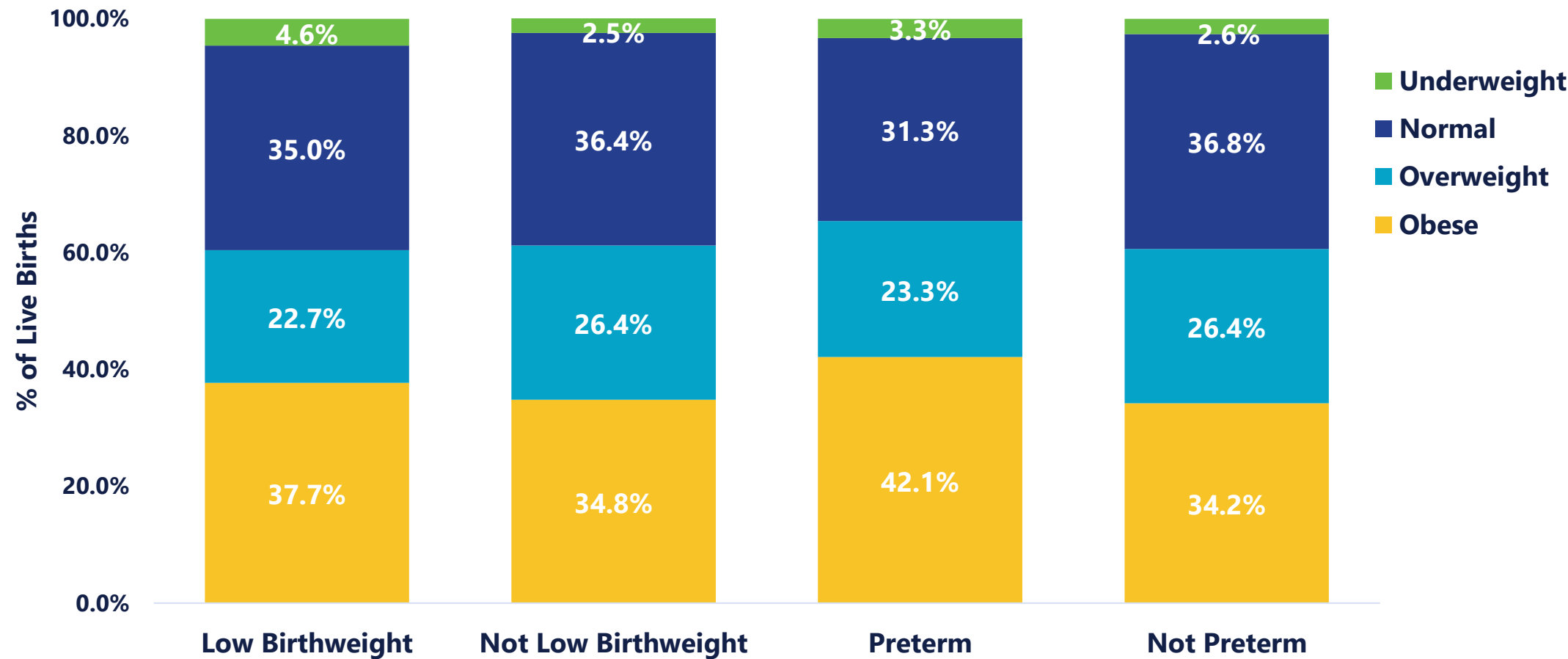
Very Low Birth Weight Births



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 2023

Low Birthweight and Preterm by BMI, Indiana 2021



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



Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 7, 2023]
Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

2021 Smoking During Pregnancy

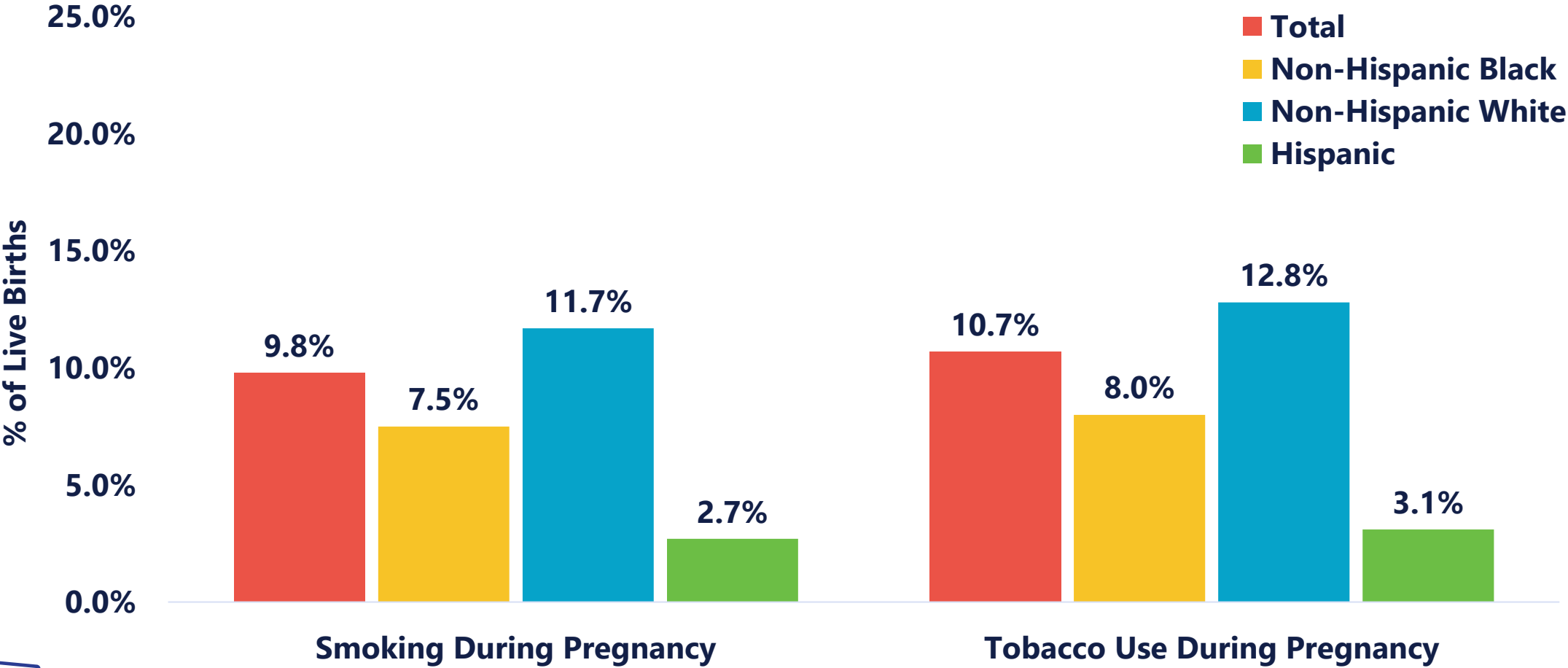
- Births exposed to **cigarette smoking during pregnancy**: 9.8%
 - Differs from previous years' smoking during pregnancy metrics and should not be compared to that data over time
 - The new smoking during pregnancy variable includes responses to the number of cigarettes smoked per day by trimester, first cigarette use after waking up, and attempts to quit smoking during pregnancy
- Of the records indicating **time until first cigarette** after waking up:
 - 10.6% reported cigarette use within 5 minutes
 - 24.3% reported cigarette use between 6 and 30 minutes
 - 16.7% reported cigarette use between 30 minutes and 1 hour
- About 2,800 birth records document an **attempt to quit cigarette use** (stopped smoking for at least one day)

2021 Tobacco Use During Pregnancy

- Births exposed to **any tobacco use during pregnancy**: 10.7%
 - This variable includes a 'yes' response to use of any of the following tobacco products: cigarettes, e-cigarettes, vapes, cigarillos, little cigars, chewing tobacco, snus, nicotine pouches, hookah, shisha, or water pipe
- At any point during pregnancy did you use*:
 - **E-cigarettes or vapes**: 2.0%
 - **Cigarillos or little cigars**: 0.3%
 - **Chewing tobacco, snus, or nicotine pouches (smokeless tobacco)**: 0.1%
 - **Hookah, shisha, or water pipe**: 0.1%
- About 1,000 birth records document an **attempt to quit any tobacco use** other than cigarettes (stopped use for at least one day)

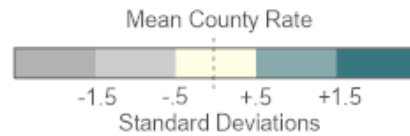
Smoking & Tobacco Use During Pregnancy

Indiana by Race and Ethnicity, 2021



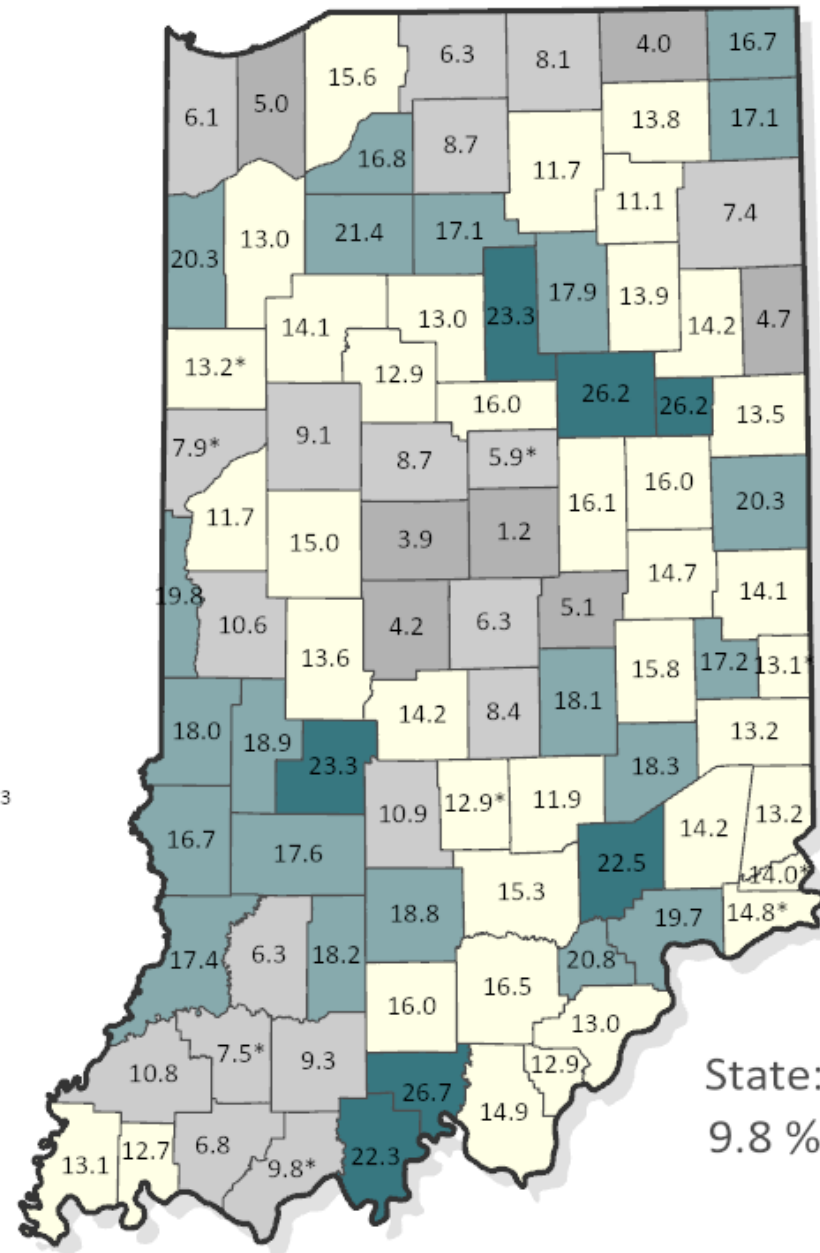
Smoking During Pregnancy Indiana, By County 2021

Percent of Live Births

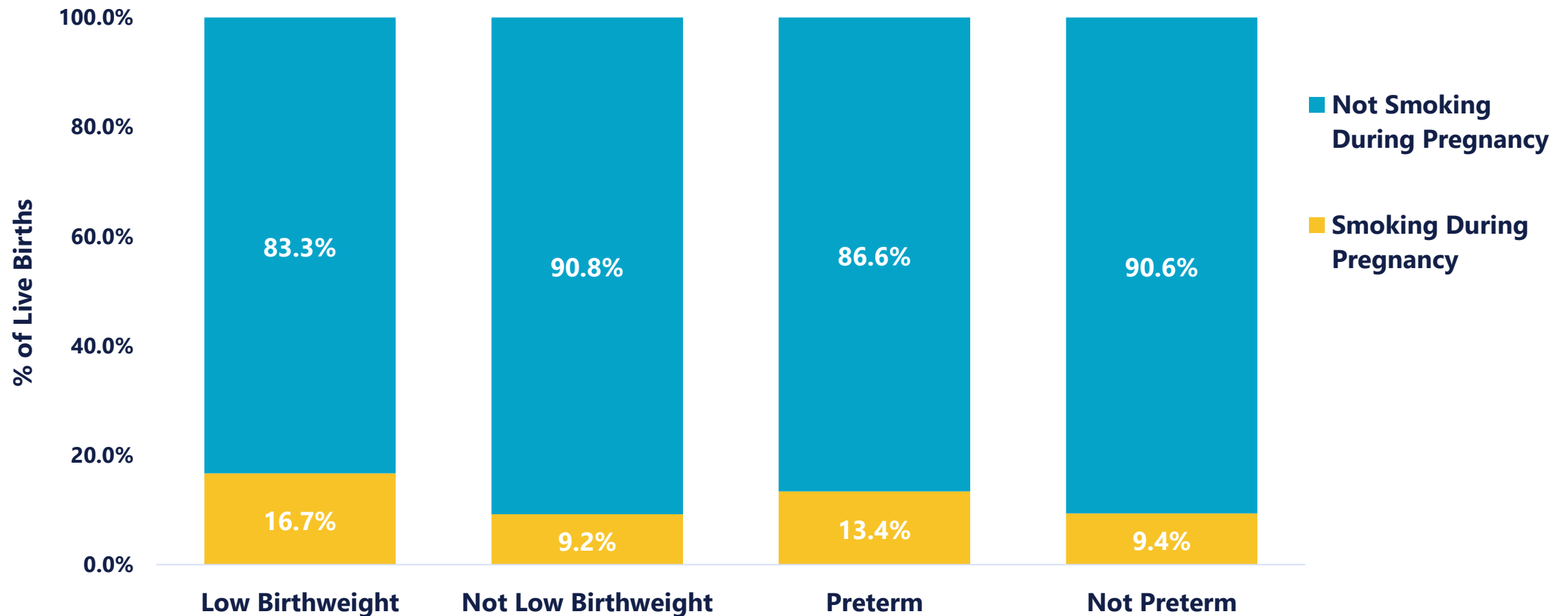


* Denotes unstable rate (<20 events)

Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG, March 2023

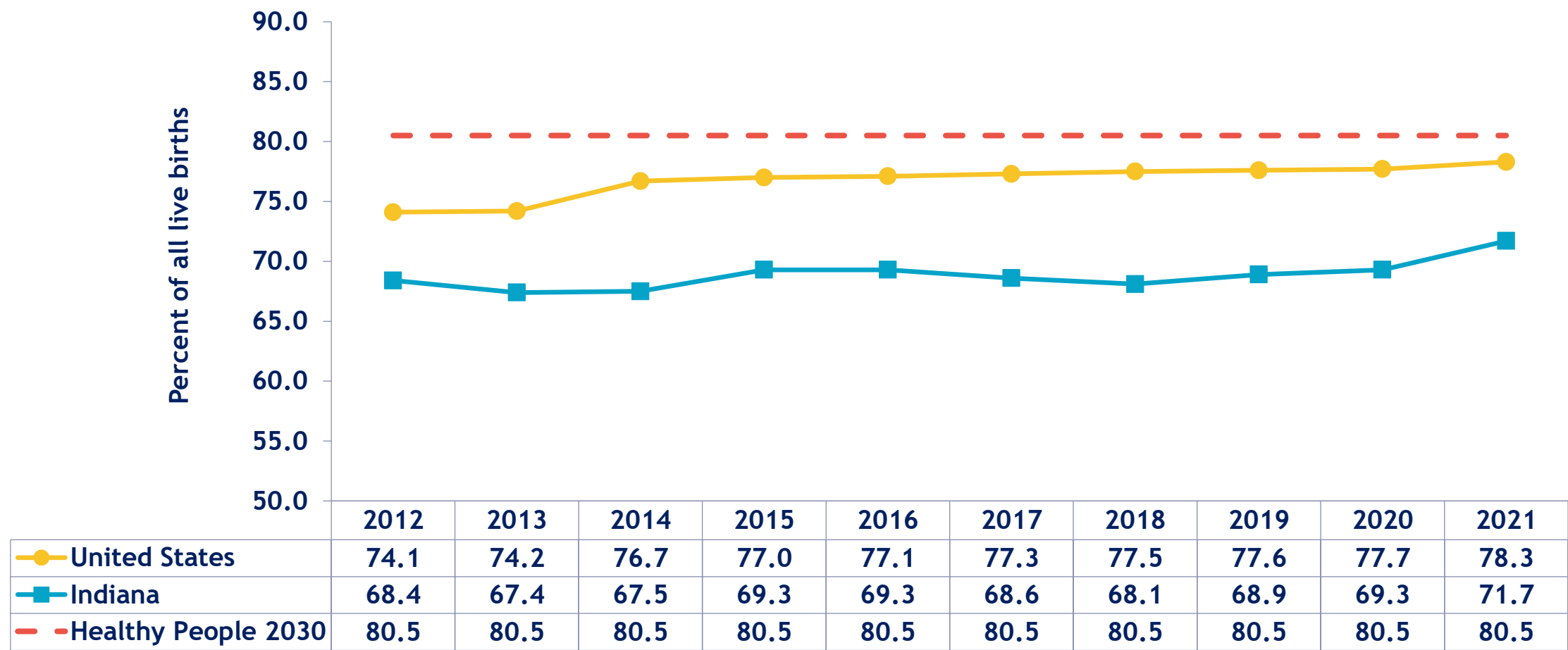


Low Birthweight & Preterm by Smoking Status, Indiana 2021



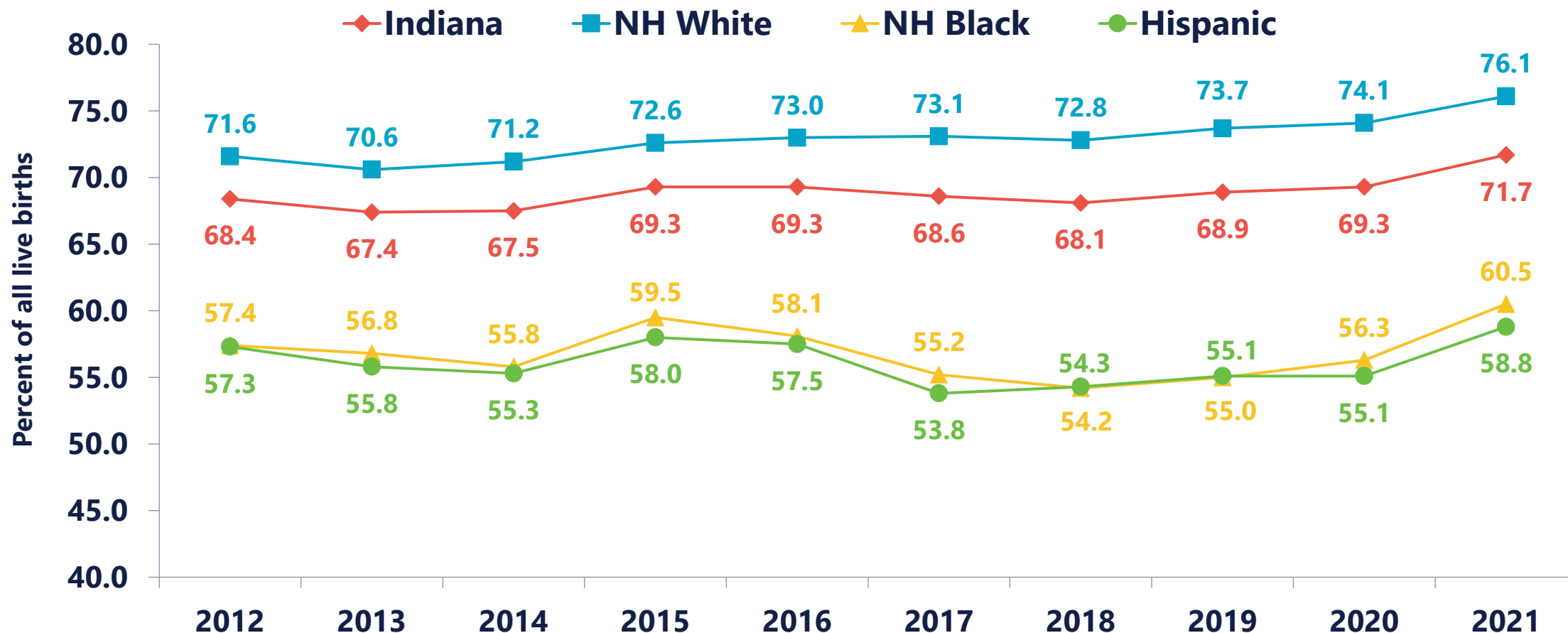
% Receiving PNC 1st Trimester

Indiana, U.S. and Healthy People Goal, 2012-2021

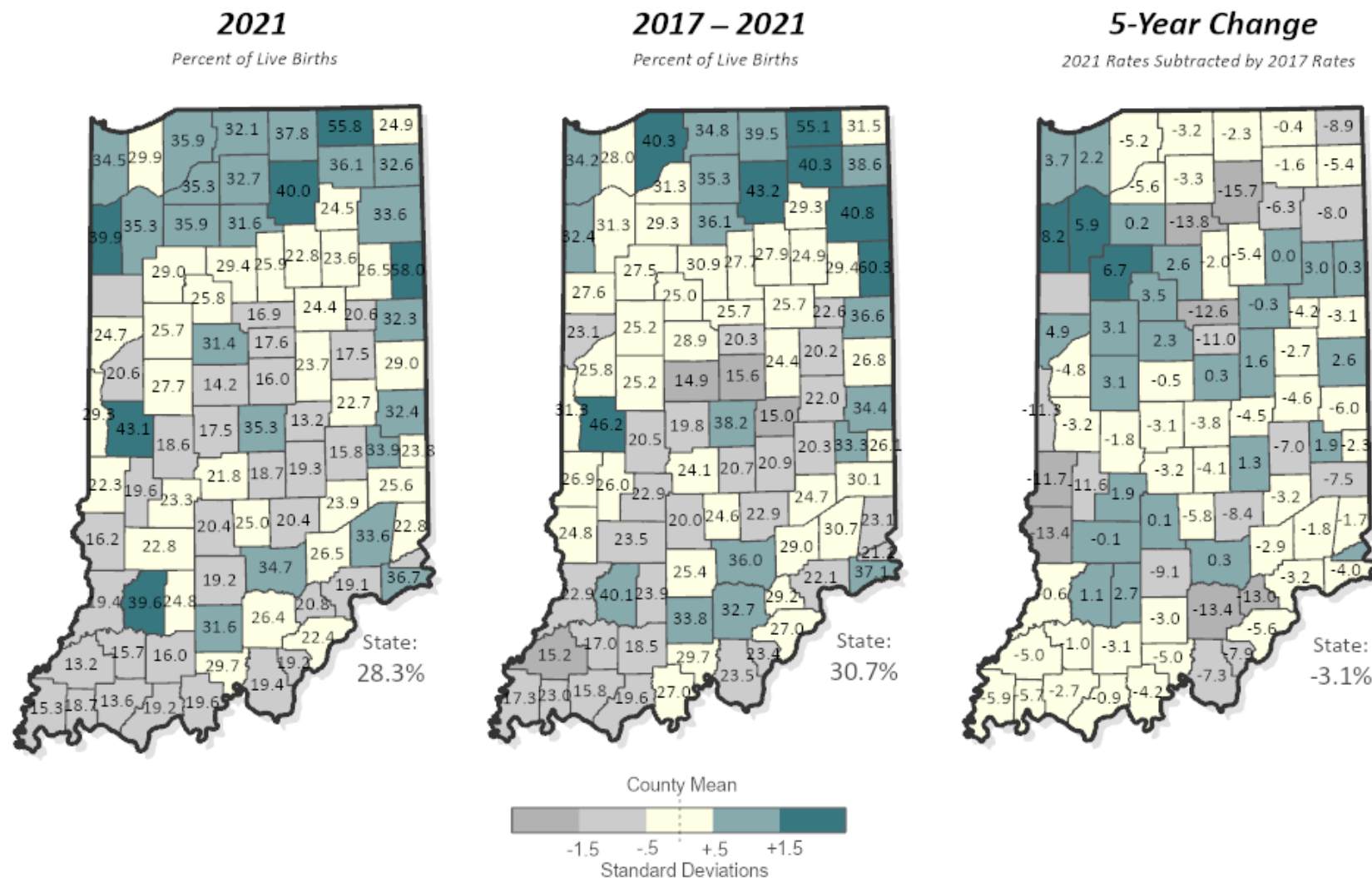


% Receiving PNC 1st Trimester

Indiana by Race and Ethnicity, 2012-2021



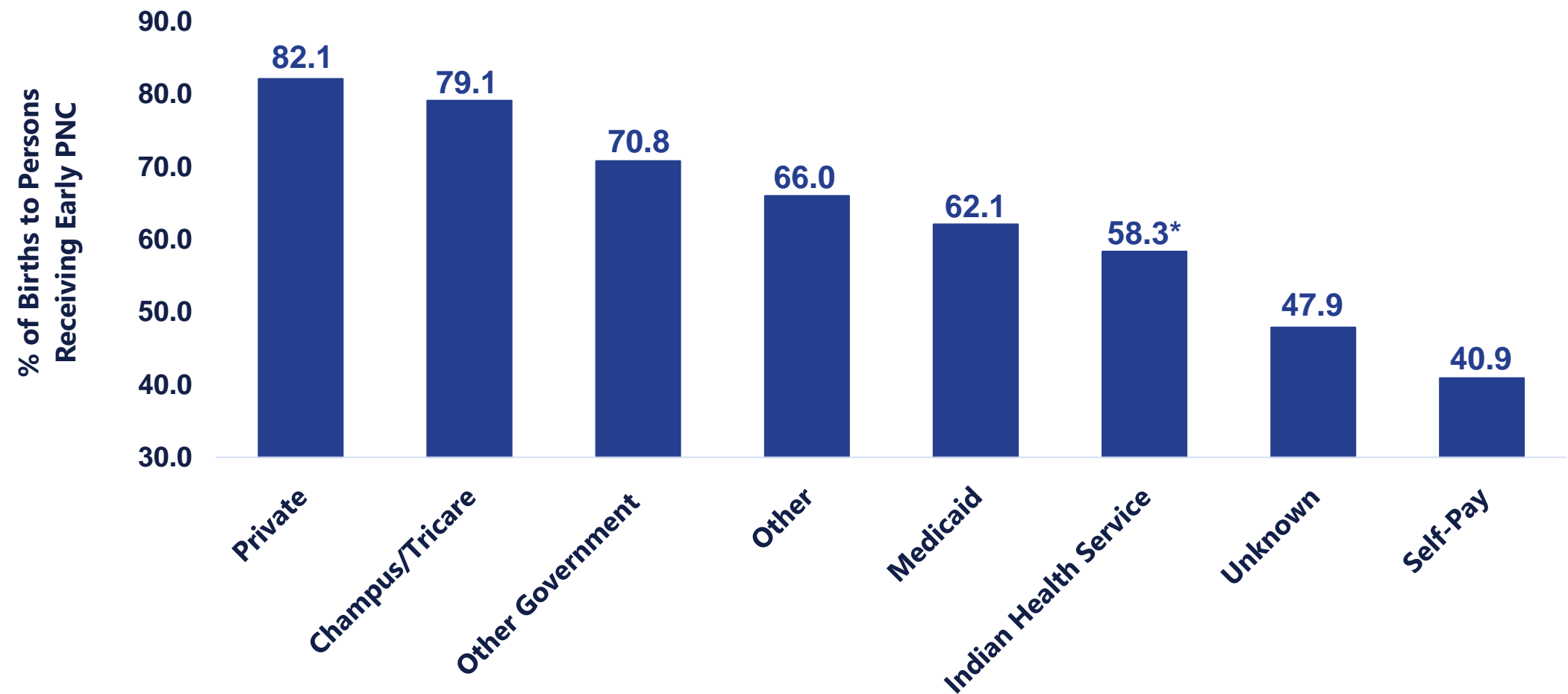
No Early Prenatal Care



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 2023

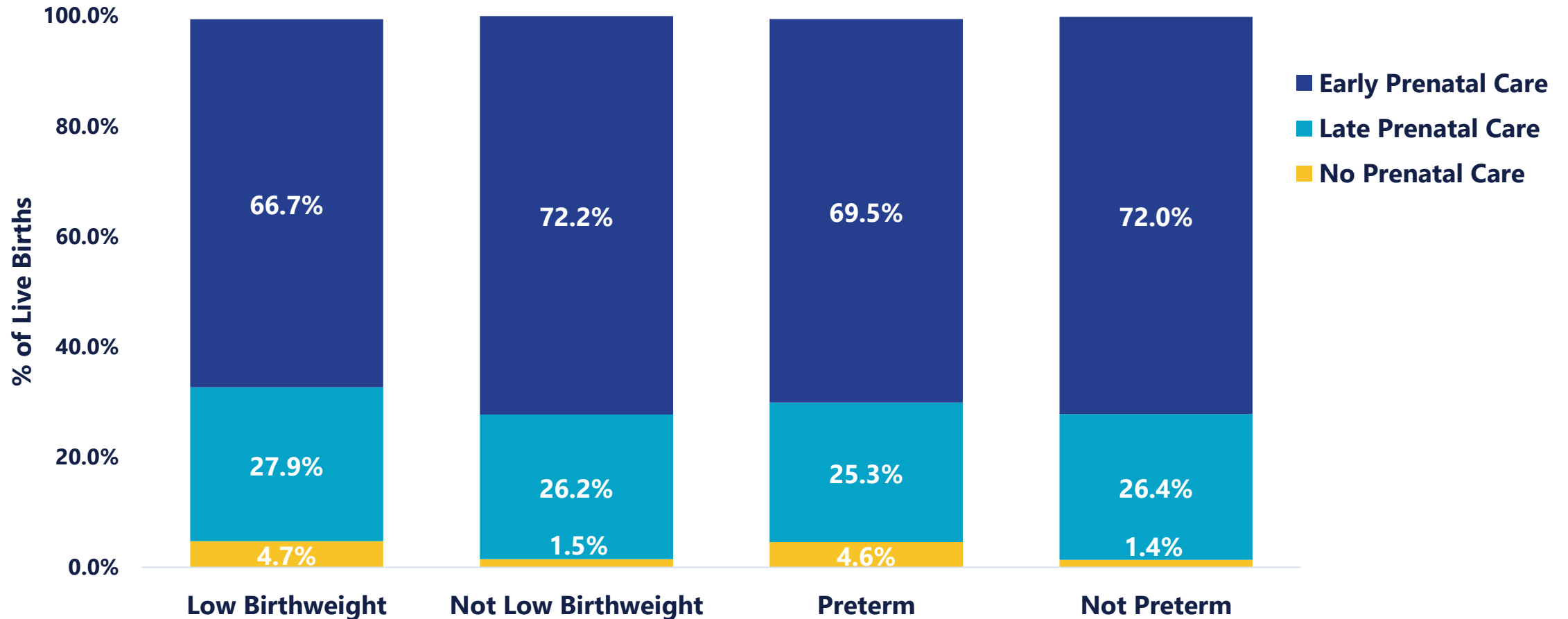
1st Trimester PNC by Insurance Type, Indiana 2021



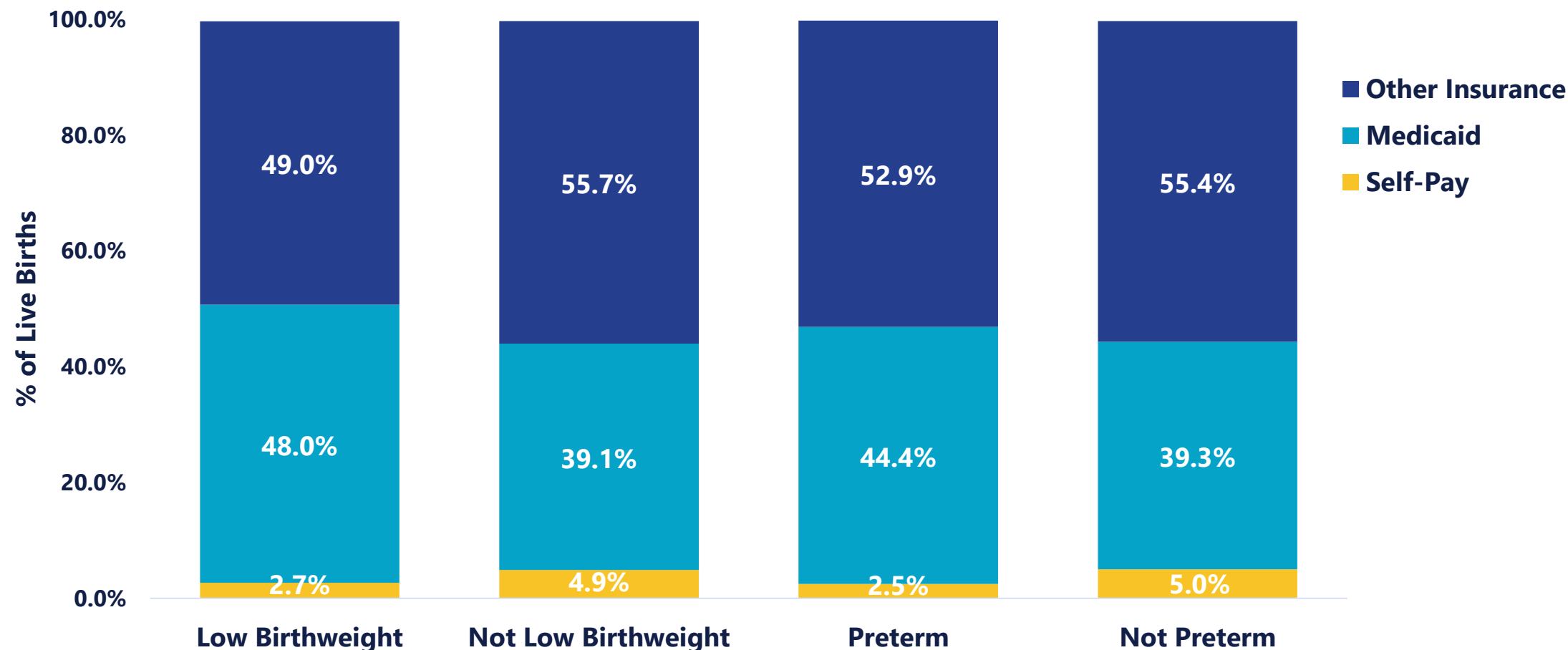
PNC = Prenatal Care
* Rates based on counts less than 20 are considered unstable and should be interpreted with caution.

Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [February 20, 2023]
Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

Low Birthweight and Preterm by Prenatal Care, Indiana 2021



Low Birthweight and Preterm by Insurance, Indiana 2021



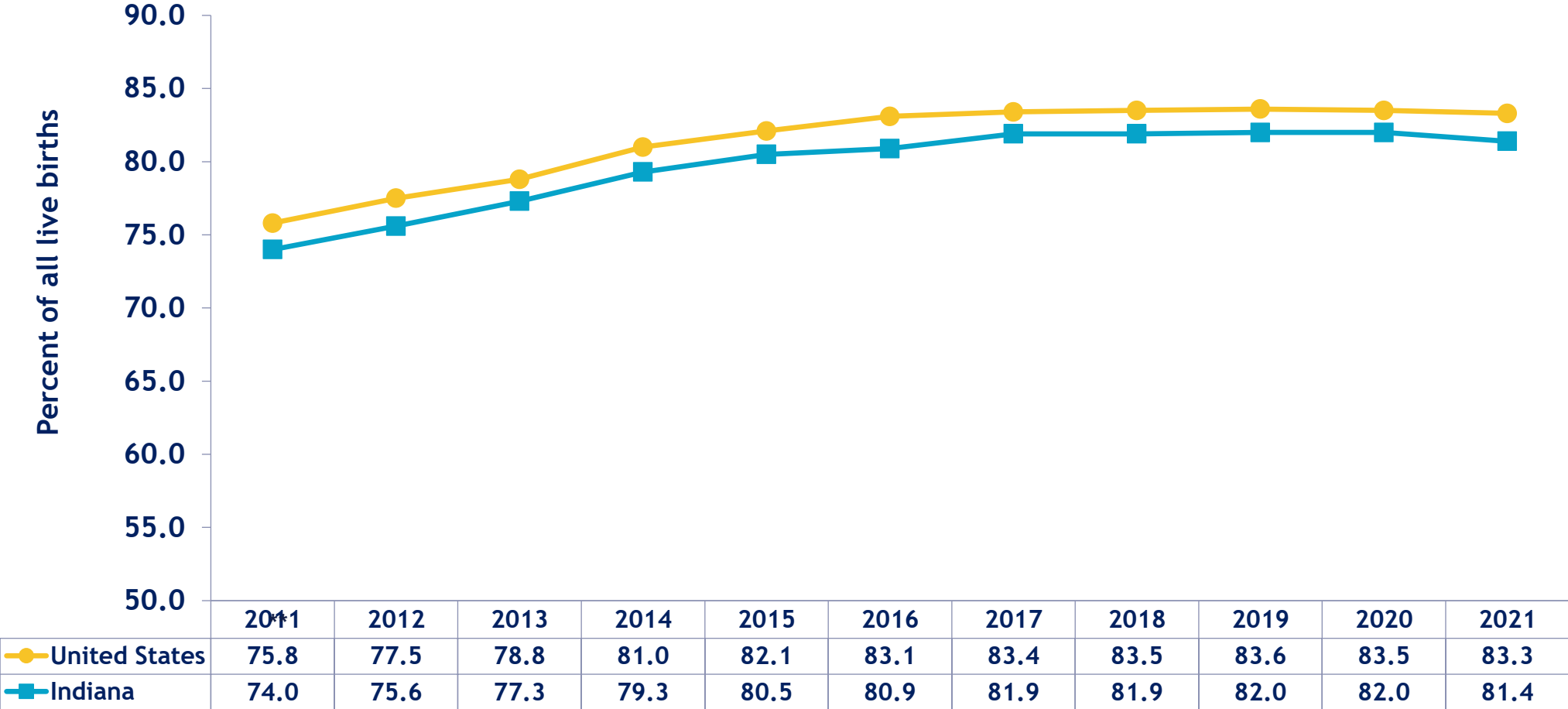
Low Birthweight = < 2,500 grams Preterm = Gestation < 37 weeks



Source: Indiana Department of Health, Maternal & Child Health Epidemiology Division [March 3, 2023]
Original Source: Indiana Department of Health, Vital Records, ODA, Data Analysis Team

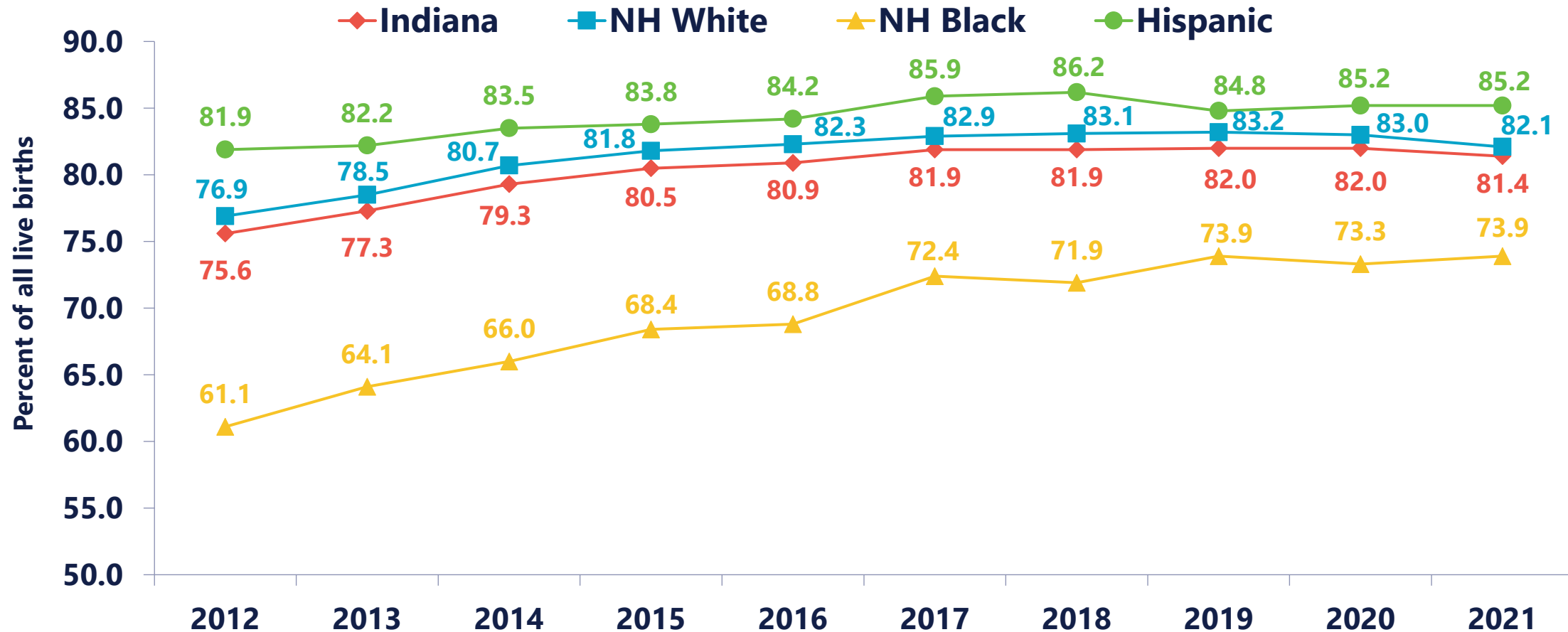
% Infants Breastfed at Hospital Discharge

Indiana, U.S. and Healthy People Goal, 2012-2021

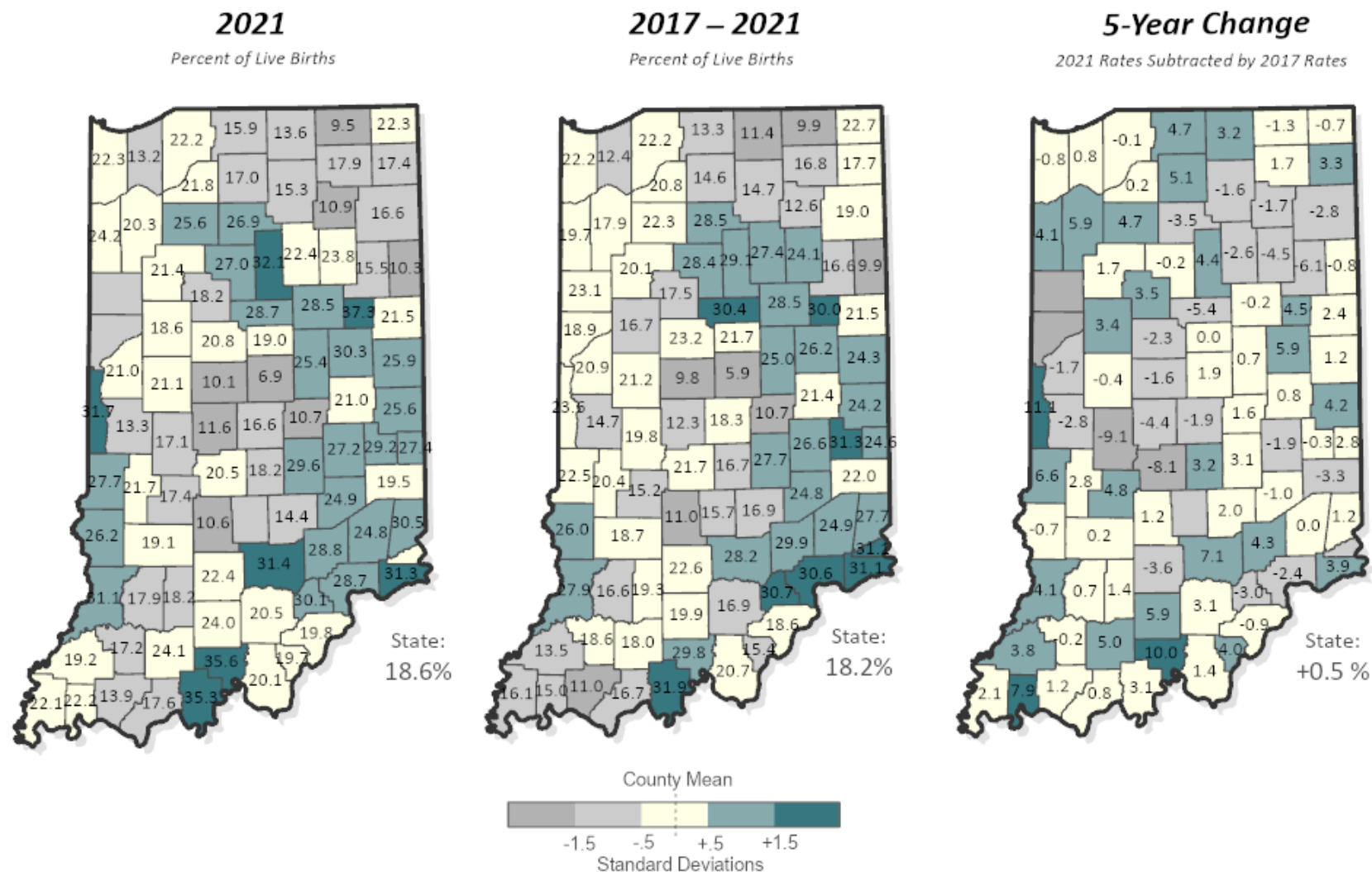


% Infants Breastfed at Hospital Discharge

Indiana by Race and Ethnicity, 2012-2021



Infants Not Breastfed at Hospital Discharge



Data Source: IDOH MCH, ODA DAT, VR | Map Author: IDOH ODA PHG March 2023

2021 Summary

- *536 infants* in Indiana died before their first birthday.
- *Perinatal Risks* are the *top cause of infant mortality* in Indiana
- *Over 15% of infant deaths* can be attributed to *SUIDs*
- *Preterm births* have been *increasing* in recent years
- *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

Questions?

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