

Neonatal Abstinence Syndrome Michigan 2012 – 2021

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Data source: Michigan Resident Live Birth Files Linked with Michigan Hospital Discharge Data,
Division for Vital Records and Health Statistics, MDHHS

July 2023

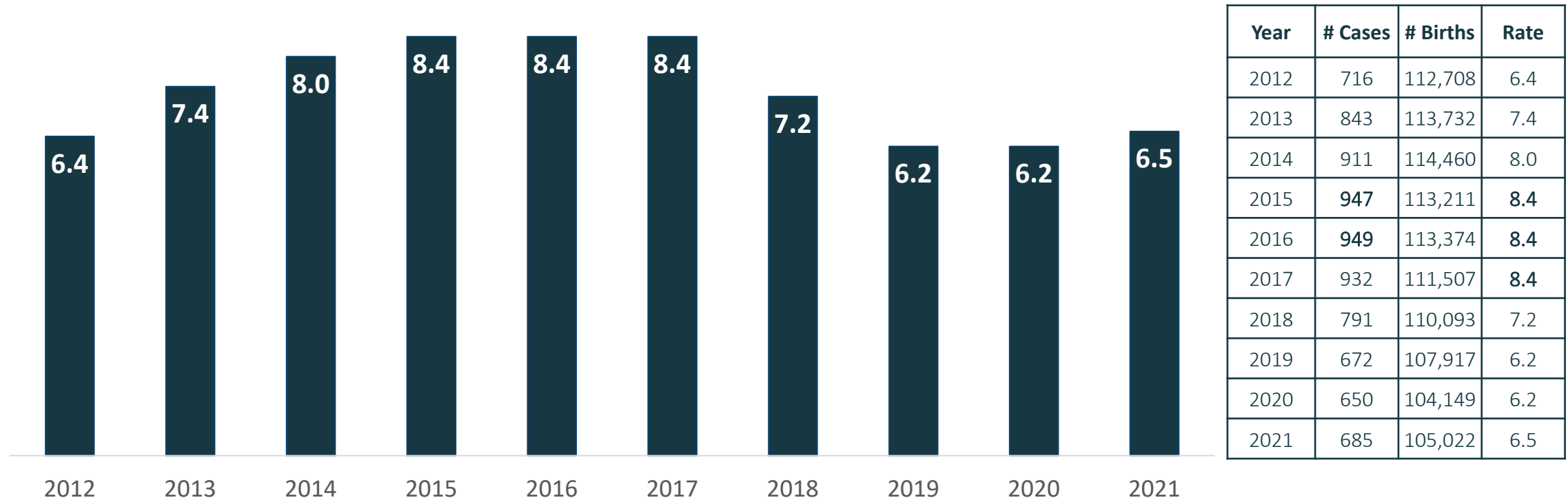
About the Data

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 Rate Michigan, 2012-2021

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

Rate per 1,000 Live Births



Neonatal Abstinence Syndrome by Maternal Race/Ethnicity, Michigan, 2021

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 | # Cases | # Births | | NAS Rate per 1,000 Live Births |
|--------------------|------------|----------|------|--------------------------------|
| Overall | 685 | 105,022 | 6.5 | 6.5 |
| White non-Hispanic | 537 | 72,071 | 7.5 | 7.5 |
| Black non-Hispanic | 75 | 18,175 | 4.1 | 4.1 |
| Hispanic | 34 | 7,056 | 4.8 | 4.8 |
| American Indian | 19 | 409 | 46.5 | 46.5 |

Neonatal Abstinence Syndrome by Race/Ethnicity, Michigan, 2017-2021

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

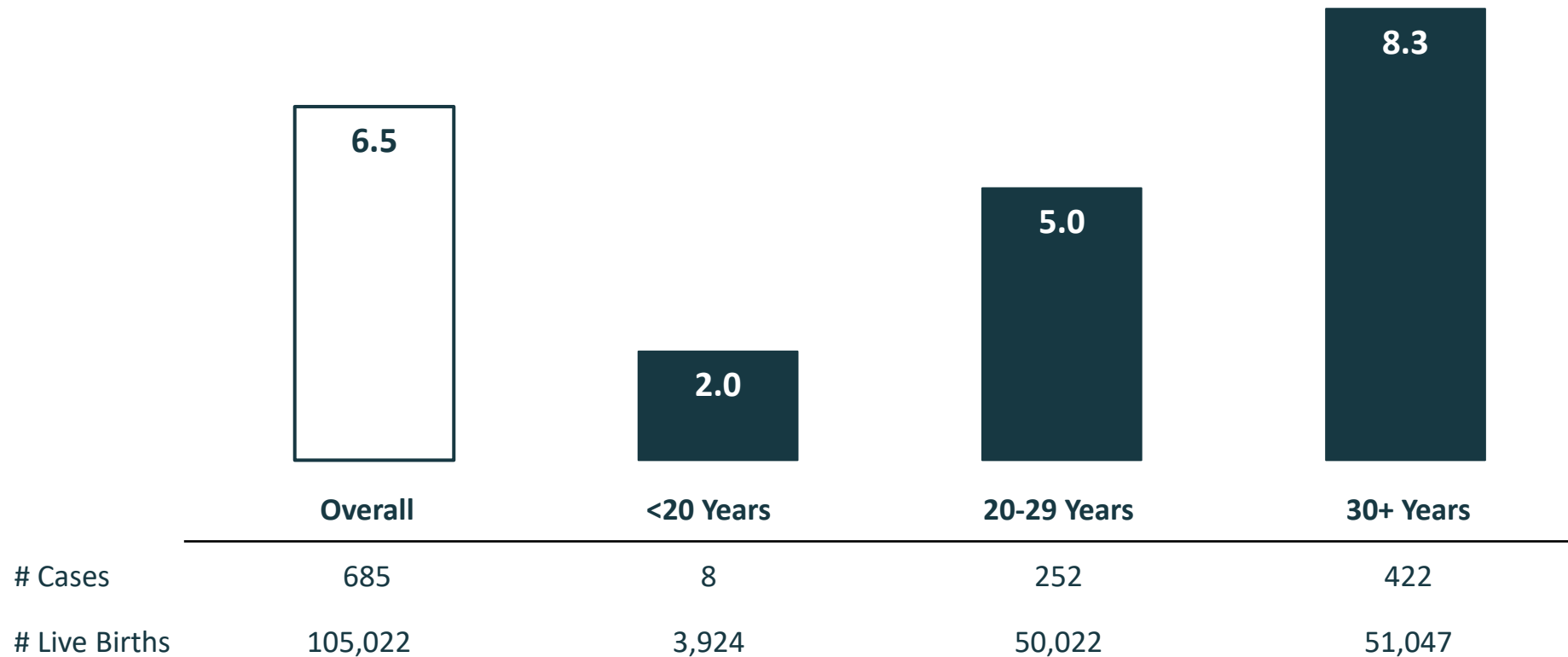
Data on this slide is aggregated over 5 years

| Comparison of methods used to measure cases among Native Americans | # Cases | # Live Births | Rate (per 1,000 Live Births) |
|--|---------|---------------|---------------------------------|
| #1: Birthing mother is identified on the birth certificate as American Indian and Non-Hispanic | 93 | 1,985 | 46.9 |
| #2: Birthing mother is identified on the birth certificate as American Indian or Mixed Race (i.e., American Indian or Alaskan Native). | 125 | 3,562 | 35.1 |
| #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) | 168 | 5,728 | 29.3 |

Neonatal Abstinence Syndrome by Maternal Age, Michigan, 2021

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

Rate per 1,000 Live Births



Neonatal Abstinence Syndrome by Maternal Education, Michigan, 2021

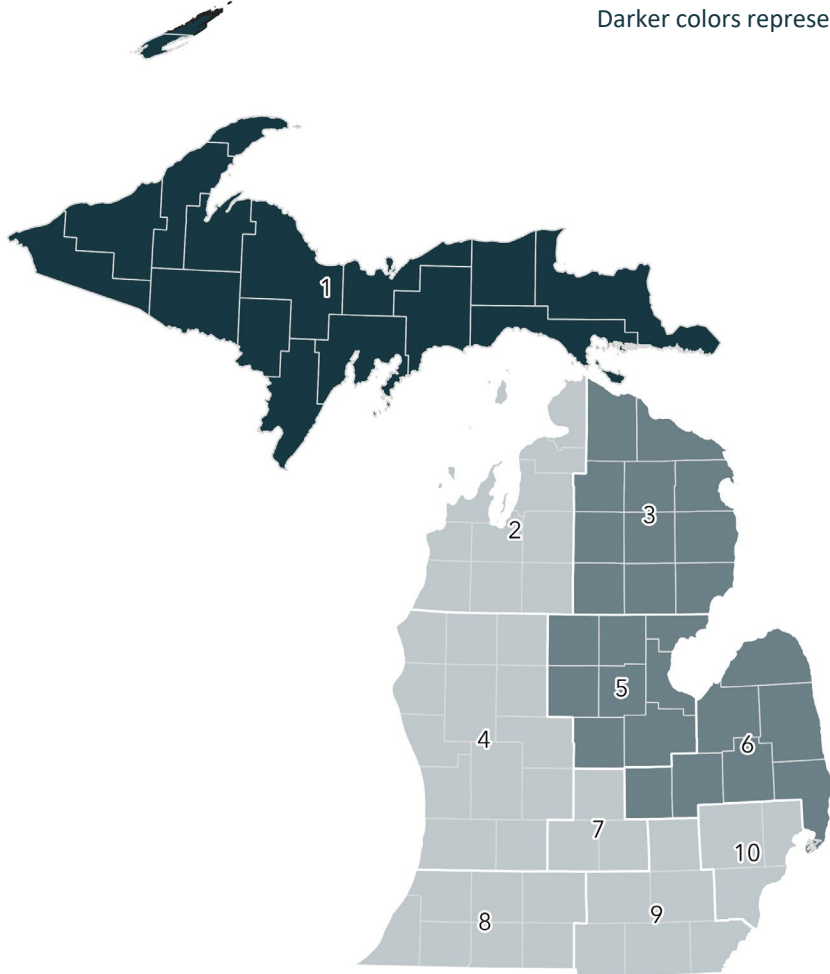
2010-2015: 779.5 (drug withdrawal syndrome in newborn) and 2016-current: P96.1 (neonatal withdrawal symptoms from maternal use of drugs of addiction)

| Maternal Education | # Cases | # Live Births | NAS Rate per 1,000 Live Births |
|-----------------------------------|---------|---------------|--------------------------------|
| Overall | 685 | 105,022 | 6.5 |
| Less than High School Diploma/GED | 175 | 9,934 | 17.6 |
| High School Diploma/GED | 229 | 27,781 | 8.2 |
| Some College | 236 | 31,885 | 7.4 |
| 4 or More Years College | 25 | 34,511 | 0.7 |

Neonatal Abstinence Syndrome by Prosperity Region, Michigan, 2020

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

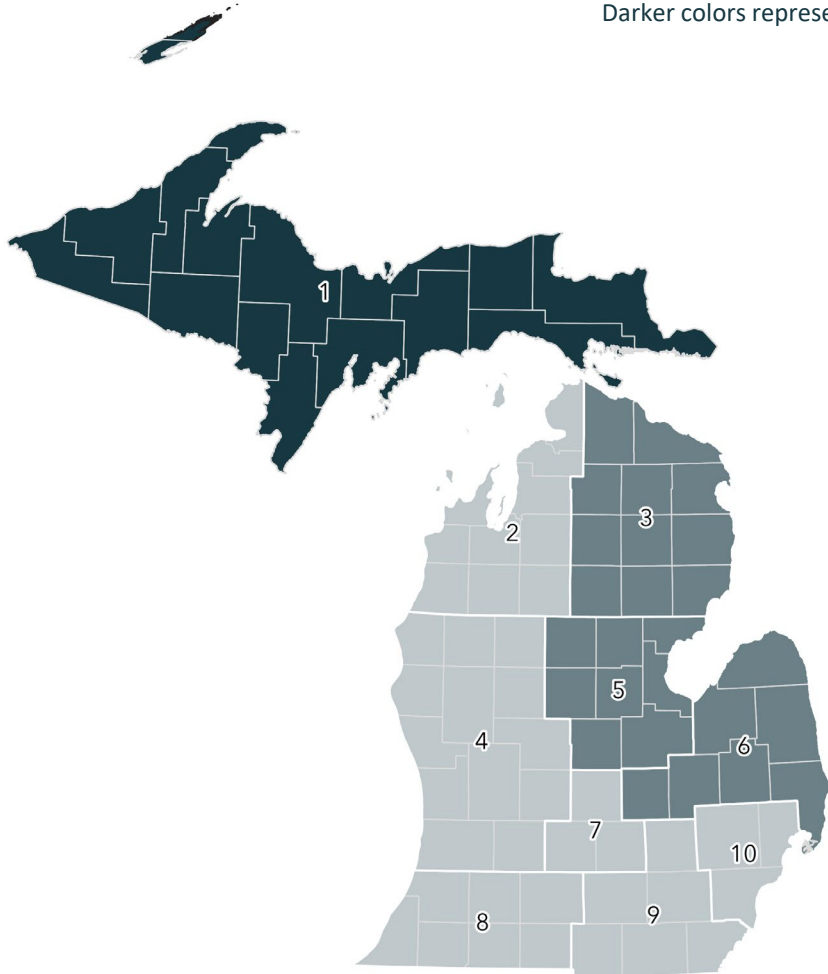
Darker colors represent higher rate of NAS relative to other regions in Michigan



| Region | # NAS Cases | # Births | Rate per 1,000 Live Births |
|----------|-------------|----------|----------------------------|
| Michigan | 650 | 104,149 | 6.2 |
| 1 | 67 | 2,489 | 26.9 |
| 2 | 23 | 2,680 | 8.6 |
| 3 | 17 | 1,613 | 10.5 |
| 4 | 53 | 18,104 | 2.9 |
| 5 | 59 | 5,333 | 11.1 |
| 6 | 102 | 8,433 | 12.1 |
| 7 | 32 | 4,653 | 6.9 |
| 8 | 33 | 8,298 | 4.0 |
| 9 | 42 | 9,660 | 4.3 |
| 10 | 222 | 42,878 | 5.2 |

Neonatal Abstinence Syndrome by Prosperity Region, Michigan, 2021

2010-2015: 779.5 (drug withdrawal syndrome in newborn) and 2016-current: P96.1 (neonatal withdrawal symptoms from maternal use of drugs of addiction)
 Darker colors represent higher rate of NAS relative to other regions in Michigan



| Region | # NAS Cases | # Births | Rate per 1,000 Live Births |
|----------|-------------|----------|----------------------------|
| Michigan | 685 | 105,022 | 6.5 |
| 1 | 70 | 2,585 | 27.1 |
| 2 | 22 | 2,776 | 7.9 |
| 3 | 18 | 1,714 | 10.5 |
| 4 | 60 | 18,253 | 3.3 |
| 5 | 64 | 5,459 | 11.7 |
| 6 | 96 | 8,527 | 11.3 |
| 7 | 28 | 4,651 | 6.0 |
| 8 | 46 | 8,364 | 5.5 |
| 9 | 45 | 9,663 | 4.7 |
| 10 | 236 | 43,025 | 5.5 |

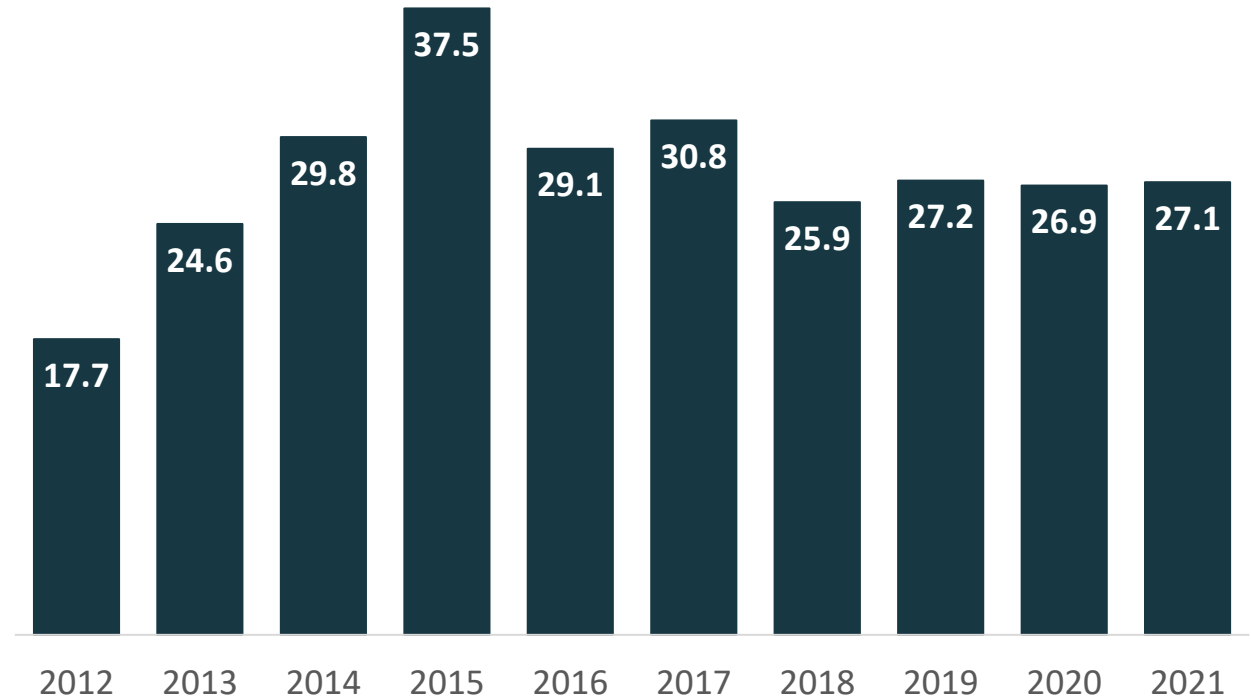


Neonatal Abstinence Syndrome

Prosperity Region 1
2012-2021

| Year | # Cases | # Births | Rate |
|------|---------|----------|------|
| 2012 | 50 | 2,829 | 17.7 |
| 2013 | 68 | 2,763 | 24.6 |
| 2014 | 85 | 2,856 | 29.8 |
| 2015 | 102 | 2,723 | 37.5 |
| 2016 | 81 | 2,786 | 29.1 |
| 2017 | 82 | 2,665 | 30.8 |
| 2018 | 69 | 2,666 | 25.9 |
| 2019 | 68 | 2,499 | 27.2 |
| 2020 | 67 | 2,489 | 26.9 |
| 2021 | 70 | 2,585 | 27.1 |

Rate per 1,000 Live Births



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

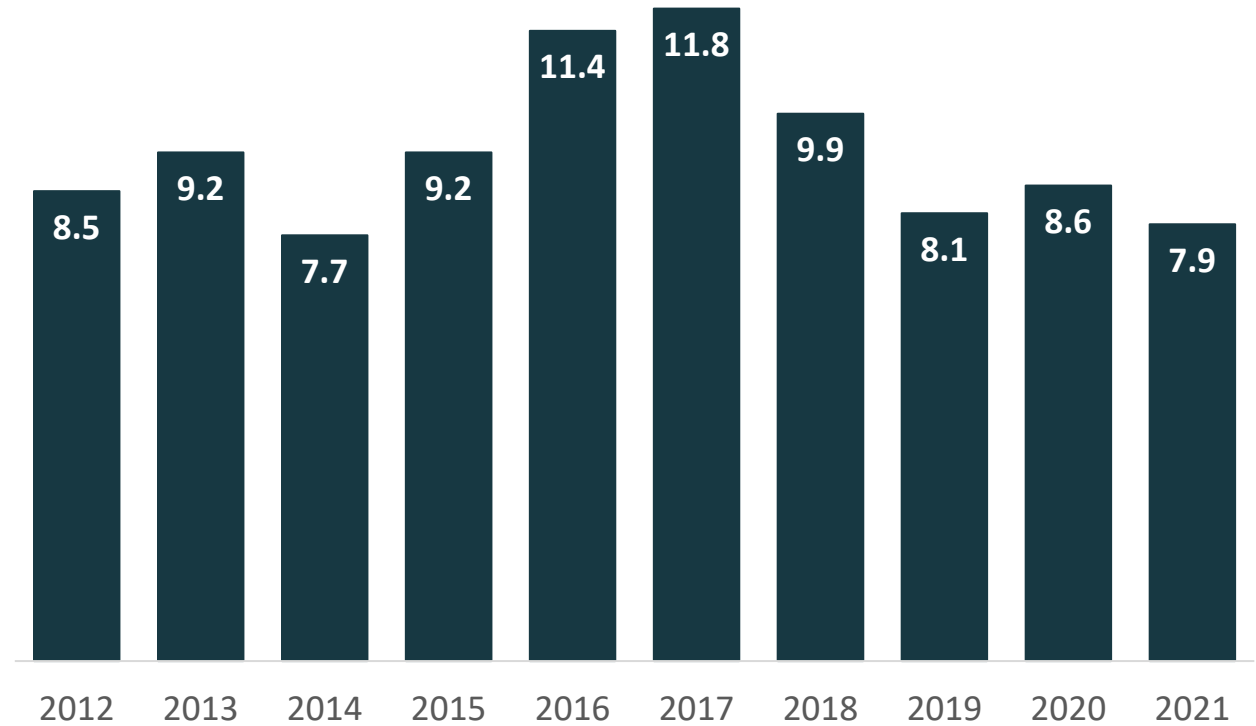


Neonatal Abstinence Syndrome

Prosperity Region 2
2012-2021

| Year | # Cases | # Births | Rate |
|------|---------|----------|------|
| 2012 | 25 | 2,924 | 8.5 |
| 2013 | 27 | 2,945 | 9.2 |
| 2014 | 23 | 2,986 | 7.7 |
| 2015 | 27 | 2,930 | 9.2 |
| 2016 | 34 | 2,973 | 11.4 |
| 2017 | 34 | 2,875 | 11.8 |
| 2018 | 28 | 2,821 | 9.9 |
| 2019 | 22 | 2,700 | 8.1 |
| 2020 | 24 | 2,680 | 8.6 |
| 2021 | 22 | 2,776 | 7.9 |

Rate per 1,000 Live Births



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

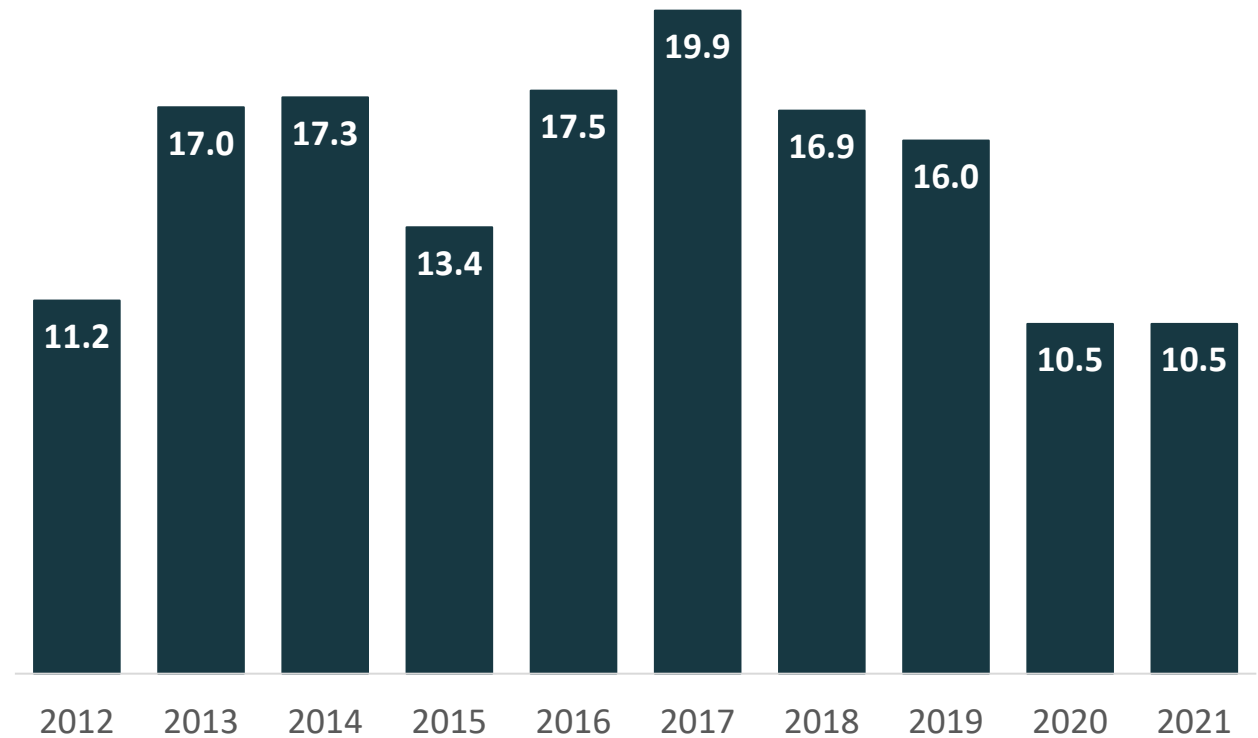


Neonatal Abstinence Syndrome

Prosperity Region 3
2012-2021

| Year | # Cases | # Births | Rate |
|------|---------|----------|------|
| 2012 | 19 | 1,704 | 11.2 |
| 2013 | 28 | 1,648 | 17.0 |
| 2014 | 31 | 1,788 | 17.3 |
| 2015 | 24 | 1,787 | 13.4 |
| 2016 | 30 | 1,715 | 17.5 |
| 2017 | 36 | 1,812 | 19.9 |
| 2018 | 29 | 1,720 | 16.9 |
| 2019 | 27 | 1,691 | 16.0 |
| 2020 | 17 | 1,613 | 10.5 |
| 2021 | 18 | 1,714 | 10.5 |

Rate per 1,000 Live Births



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

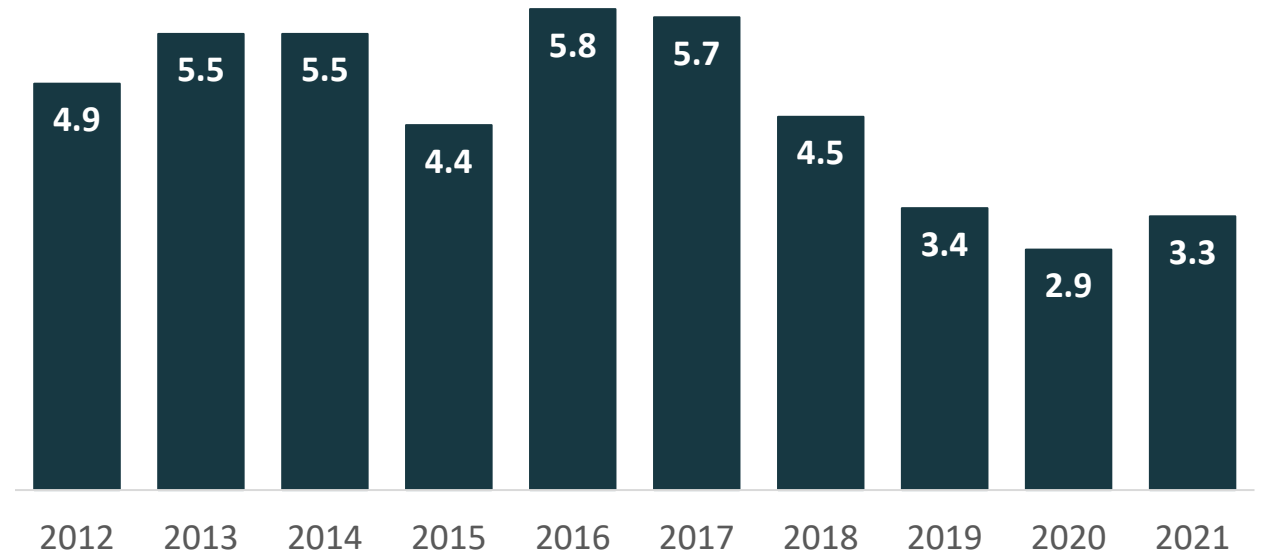


Neonatal Abstinence Syndrome

Prosperity Region 4
2012-2021

Rate per 1,000 Live Births

| Year | # Cases | # Births | Rate |
|------|---------|----------|------|
| 2012 | 98 | 19,811 | 4.9 |
| 2013 | 108 | 19,591 | 5.5 |
| 2014 | 108 | 19,802 | 5.5 |
| 2015 | 86 | 19,625 | 4.4 |
| 2016 | 115 | 19,709 | 5.8 |
| 2017 | 110 | 19,387 | 5.7 |
| 2018 | 87 | 19,218 | 4.5 |
| 2019 | 62 | 18,404 | 3.4 |
| 2020 | 53 | 18,104 | 2.9 |
| 2021 | 60 | 18,253 | 3.3 |



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

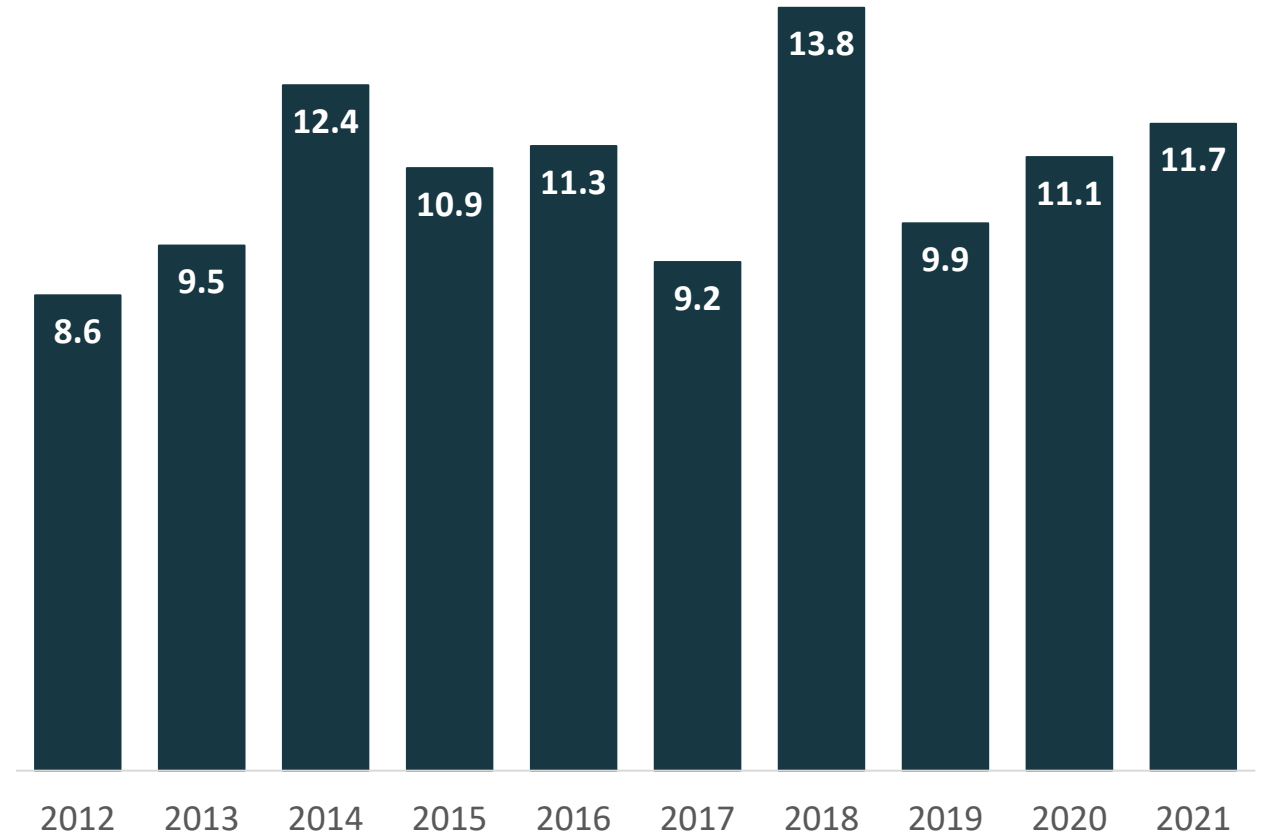


Neonatal Abstinence Syndrome

Prosperity Region 5
2012-2021

| Year | # Cases | # Births | Rate |
|------|---------|----------|------|
| 2012 | 51 | 5,915 | 8.6 |
| 2013 | 56 | 5,883 | 9.5 |
| 2014 | 75 | 6,050 | 12.4 |
| 2015 | 65 | 5,952 | 10.9 |
| 2016 | 66 | 5,829 | 11.3 |
| 2017 | 54 | 5,885 | 9.2 |
| 2018 | 79 | 5,720 | 13.8 |
| 2019 | 56 | 5,653 | 9.9 |
| 2020 | 59 | 5,333 | 11.1 |
| 2021 | 64 | 5,459 | 11.7 |

Rate per 1,000 Live Births



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

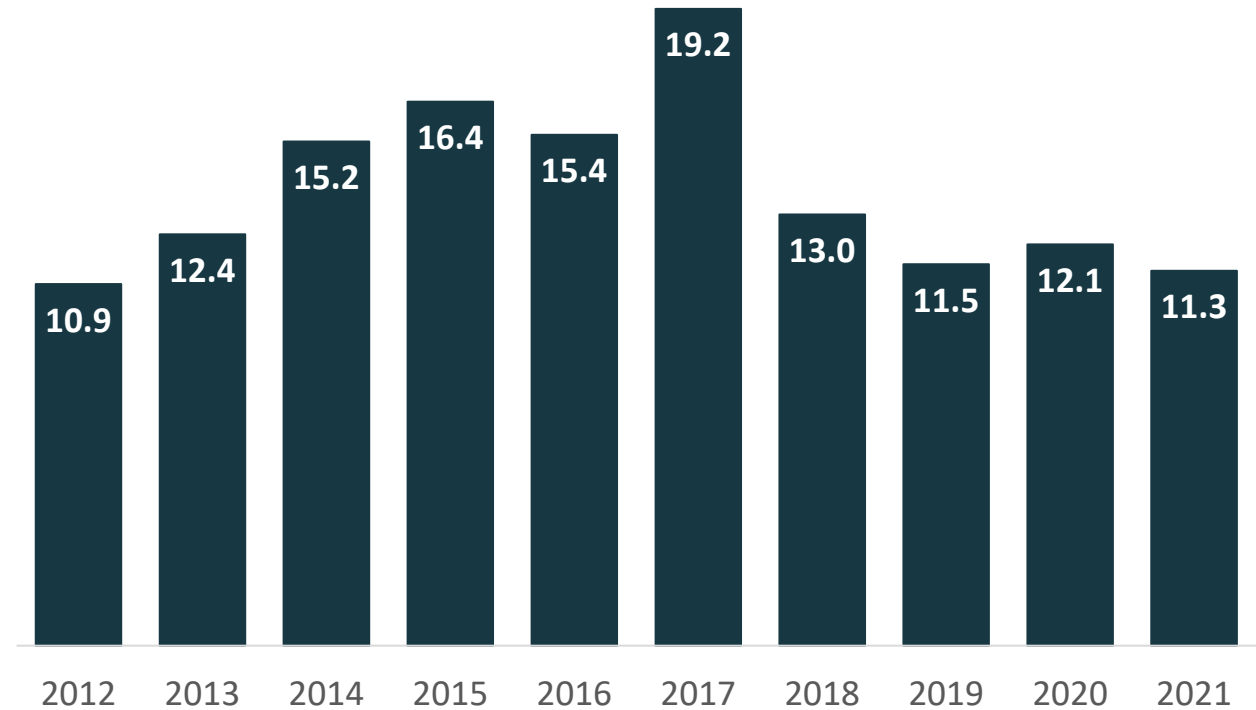


Neonatal Abstinence Syndrome

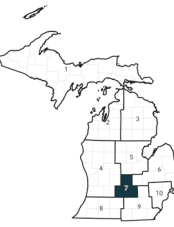
Prosperity Region 6
2012-2021

| Year | # Cases | # Births | Rate |
|------|---------|----------|------|
| 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 |

Rate per 1,000 Live Births



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

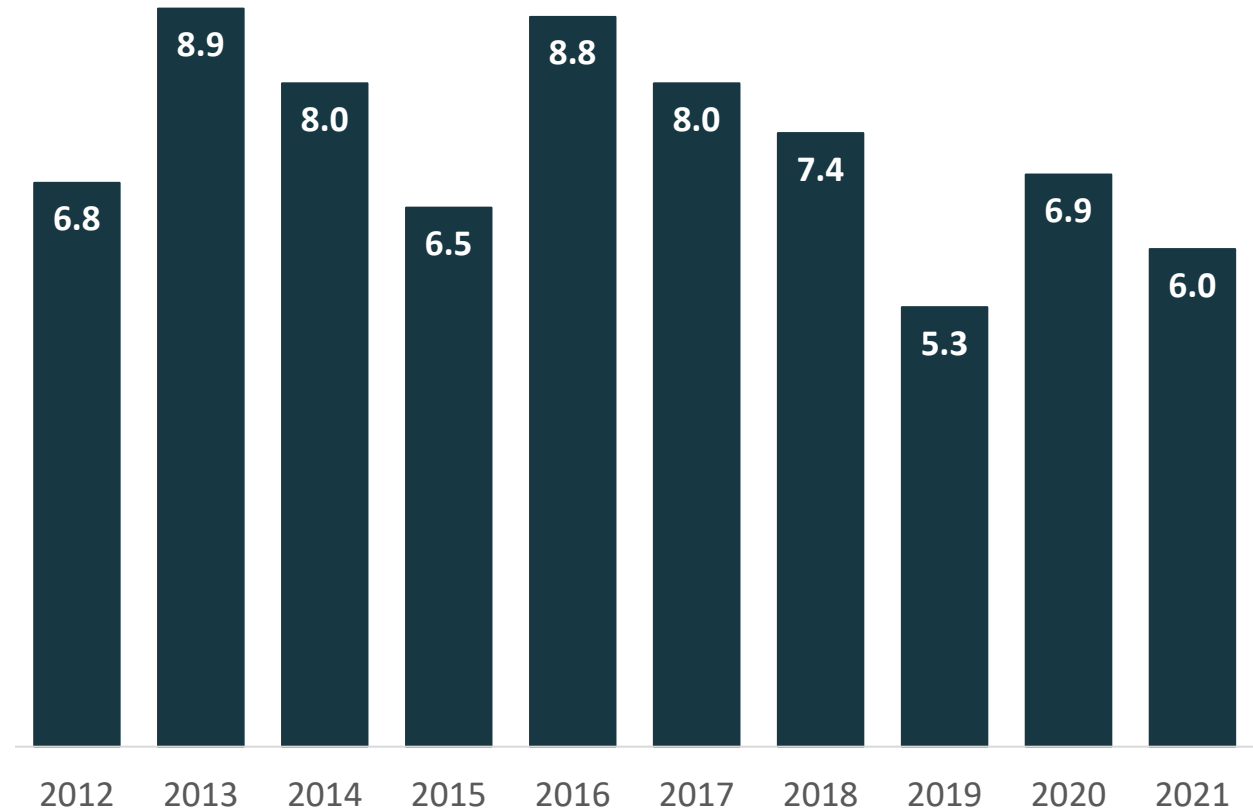


Neonatal Abstinence Syndrome

Prosperity Region 7
2012-2021

| Year | # Cases | # Births | Rate |
|------|---------|----------|------|
| 2012 | 36 | 5,270 | 6.8 |
| 2013 | 46 | 5,175 | 8.9 |
| 2014 | 43 | 5,361 | 8.0 |
| 2015 | 34 | 5,205 | 6.5 |
| 2016 | 47 | 5,357 | 8.8 |
| 2017 | 41 | 5,130 | 8.0 |
| 2018 | 37 | 4,972 | 7.4 |
| 2019 | 26 | 4,928 | 5.3 |
| 2020 | 32 | 4,653 | 6.9 |
| 2021 | 28 | 4,651 | 6.0 |

Rate per 1,000 Live Births



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

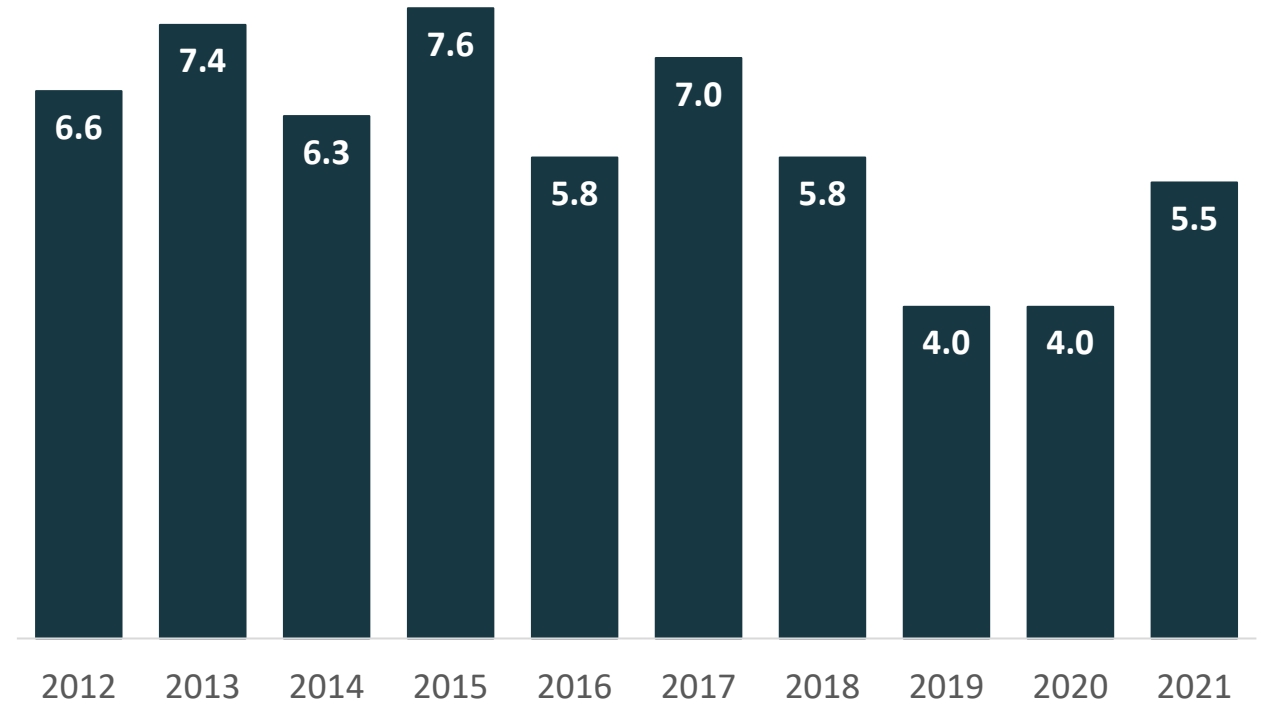


Neonatal Abstinence Syndrome

Prosperity Region 8
2012-2021

| Year | # Cases | # Births | Rate |
|------|---------|----------|------|
| 2012 | 60 | 9,147 | 6.6 |
| 2013 | 71 | 9,582 | 7.4 |
| 2014 | 60 | 9,470 | 6.3 |
| 2015 | 70 | 9,268 | 7.6 |
| 2016 | 53 | 9,131 | 5.8 |
| 2017 | 63 | 8,970 | 7.0 |
| 2018 | 52 | 8,915 | 5.8 |
| 2019 | 35 | 8,711 | 4.0 |
| 2020 | 33 | 8,298 | 4.0 |
| 2021 | 46 | 8,364 | 5.5 |

Rate per 1,000 Live Births



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

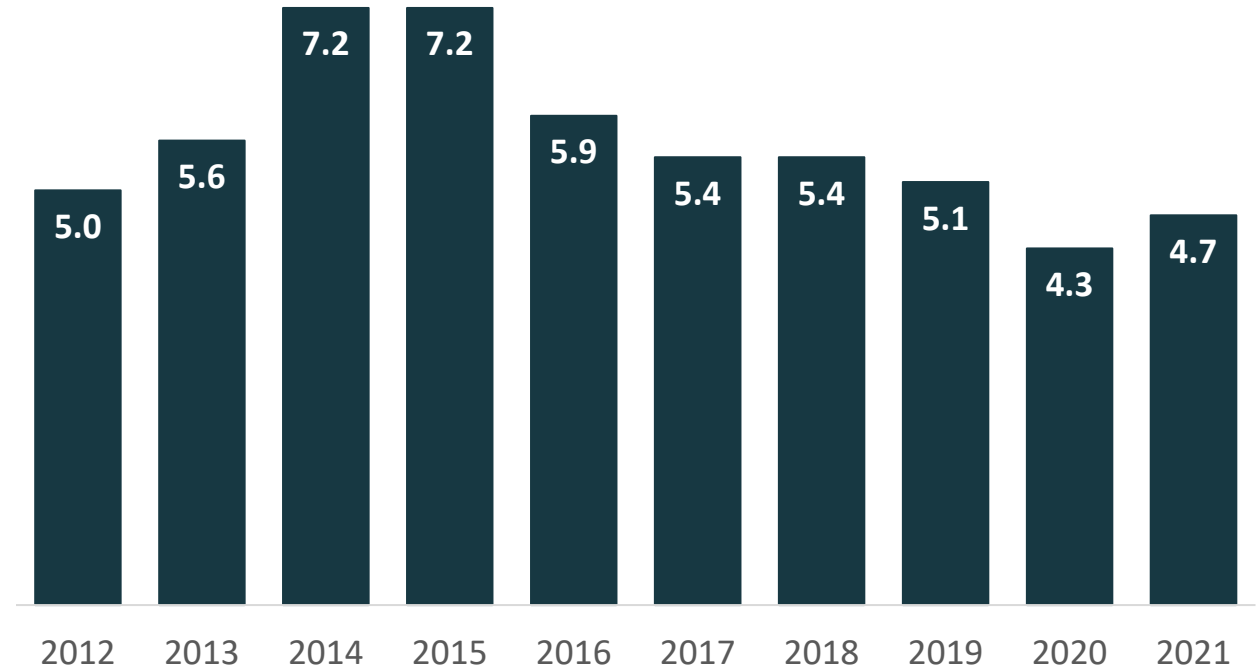


Neonatal Abstinence Syndrome

Prosperity Region 9
2012-2021

Rate per 1,000 Live Births

| Year | # Cases | # Births | Rate |
|------|---------|----------|------|
| 2012 | 51 | 10,297 | 5.0 |
| 2013 | 58 | 10,328 | 5.6 |
| 2014 | 76 | 10,571 | 7.2 |
| 2015 | 73 | 10,206 | 7.2 |
| 2016 | 62 | 10,471 | 5.9 |
| 2017 | 55 | 10,149 | 5.4 |
| 2018 | 54 | 10,035 | 5.4 |
| 2019 | 51 | 9,947 | 5.1 |
| 2020 | 42 | 9,660 | 4.3 |
| 2021 | 45 | 9,663 | 4.7 |



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

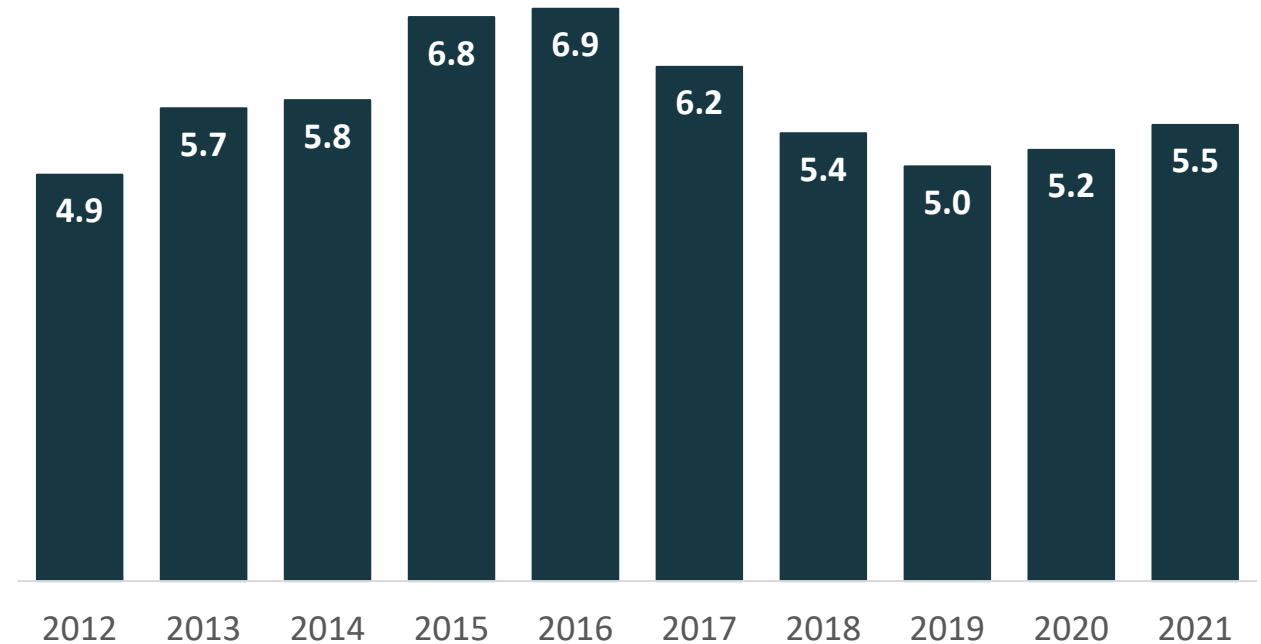


Neonatal Abstinence Syndrome

Prosperity Region 10
2012-2021

| Year | # Cases | # Births | Rate |
|------|---------|----------|------|
| 2012 | 225 | 45,505 | 4.9 |
| 2013 | 265 | 46,451 | 5.7 |
| 2014 | 267 | 46,152 | 5.8 |
| 2015 | 317 | 46,444 | 6.8 |
| 2016 | 319 | 46,185 | 6.9 |
| 2017 | 285 | 45,693 | 6.2 |
| 2018 | 242 | 45,233 | 5.4 |
| 2019 | 224 | 44,570 | 5.0 |
| 2020 | 222 | 42,878 | 5.2 |
| 2021 | 236 | 43,025 | 5.5 |

Rate per 1,000 Live Births



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