



**Neonatal Abstinence Syndrome Births:  
Trends in the United States, 2008-2018**

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This report is updated as additional Healthcare Cost and Utilization Project (HCUP) databases become available.

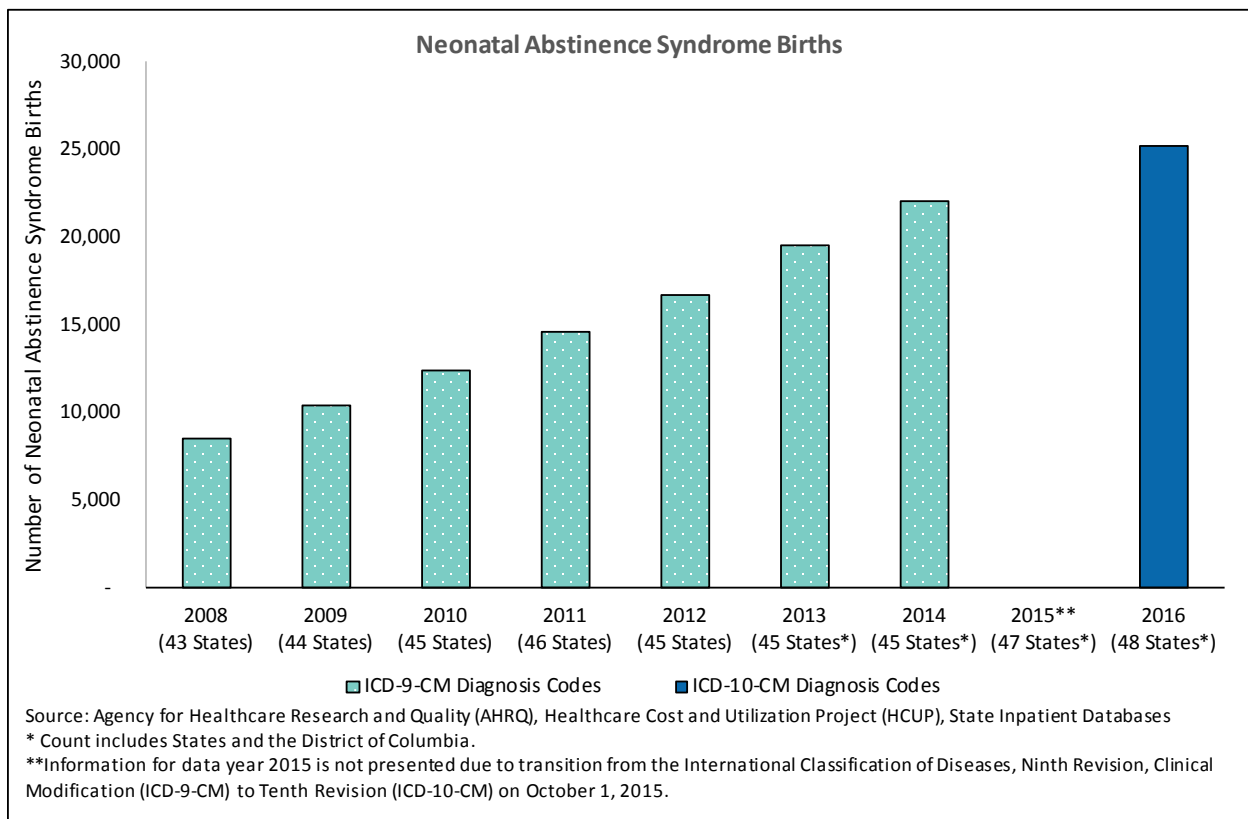
- January 18, 2019:
  - The first version included information from the HCUP State Inpatient Databases (SID) for 2008–2016 and contained only Figure 1. For data year 2016, there were SID from 47 States and the District of Columbia.
- July 11, 2019:
  - The next version added Figures 2 and 3, with Figure 1 unchanged from the January 2019 version.
  - Figure 2 included information from the 2008–2017 SID for up to 46 States and the District of Columbia. Figure 2a used all available SID in each year and Figure 2b used a consistent set of SID for each year.
  - Figure 3 included information from the 2008–2018 SID for 12 States for which 2018 data were available.

## Neonatal Abstinence Syndrome Births: Trends in the United States, 2008-2018

Four views of the trends in Neonatal Abstinence Syndrome (NAS) births in the United States are provided. The graphs differ by currency and the availability of State-level data.

The first trend graph provides final annual estimates using the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) for 2008–2016. The SID are developed through a Federal-State-Industry partnership sponsored by the Agency for Healthcare Research and Quality (AHRQ). The HCUP Partner organizations are listed in Appendix A. Background on the SID is provided in Appendix B. The underlying data table for each figure is provided in Appendix C.

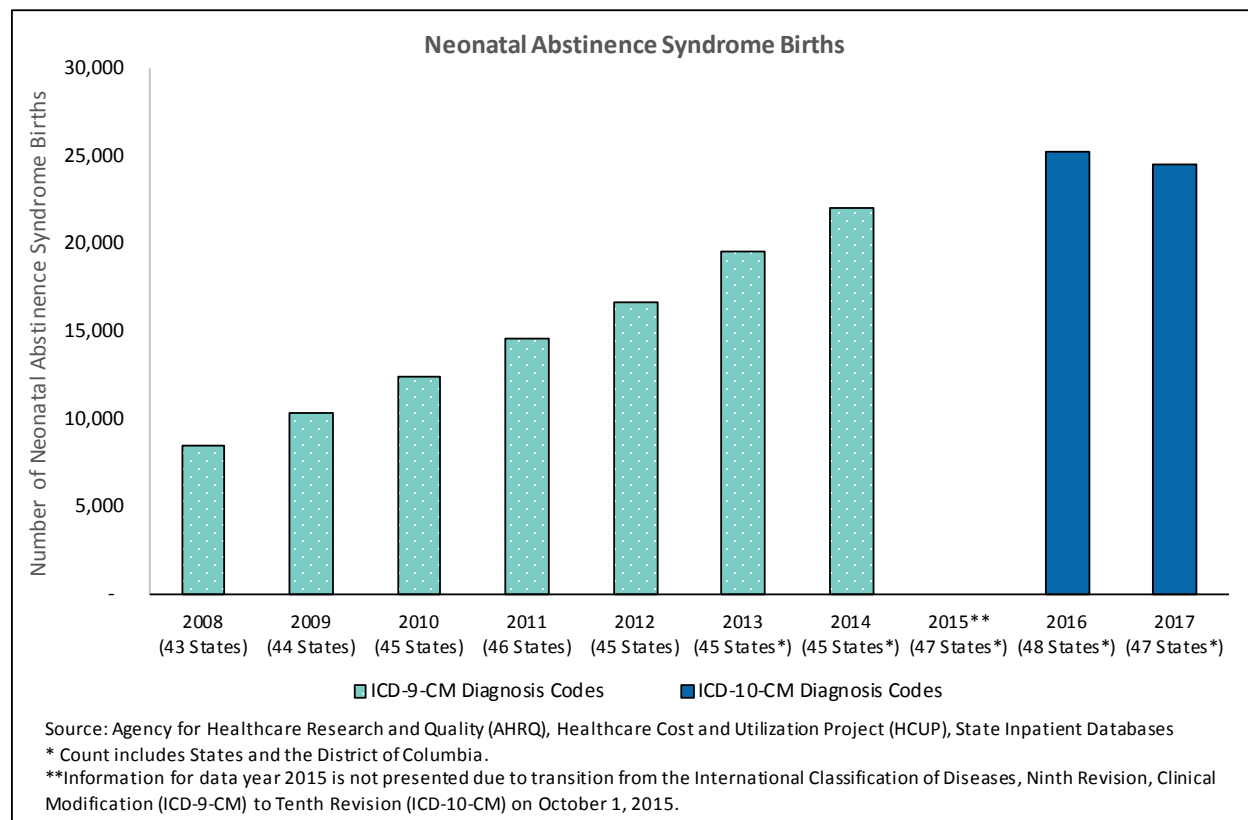
**Figure 1. Annual Number of Neonatal Abstinence Syndrome Births in the United States in Years 2008–2016 with the Number of HCUP Partner Organizations Varying by Year**



Estimates for 2016 include data from the following: Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

Figure 2a includes annual counts for the next data year (2017), but the information is limited to 46 States and the District of Columbia for which HCUP has 2017 annual data. It should be noted that not all of these States have data for all years 2008–2017.

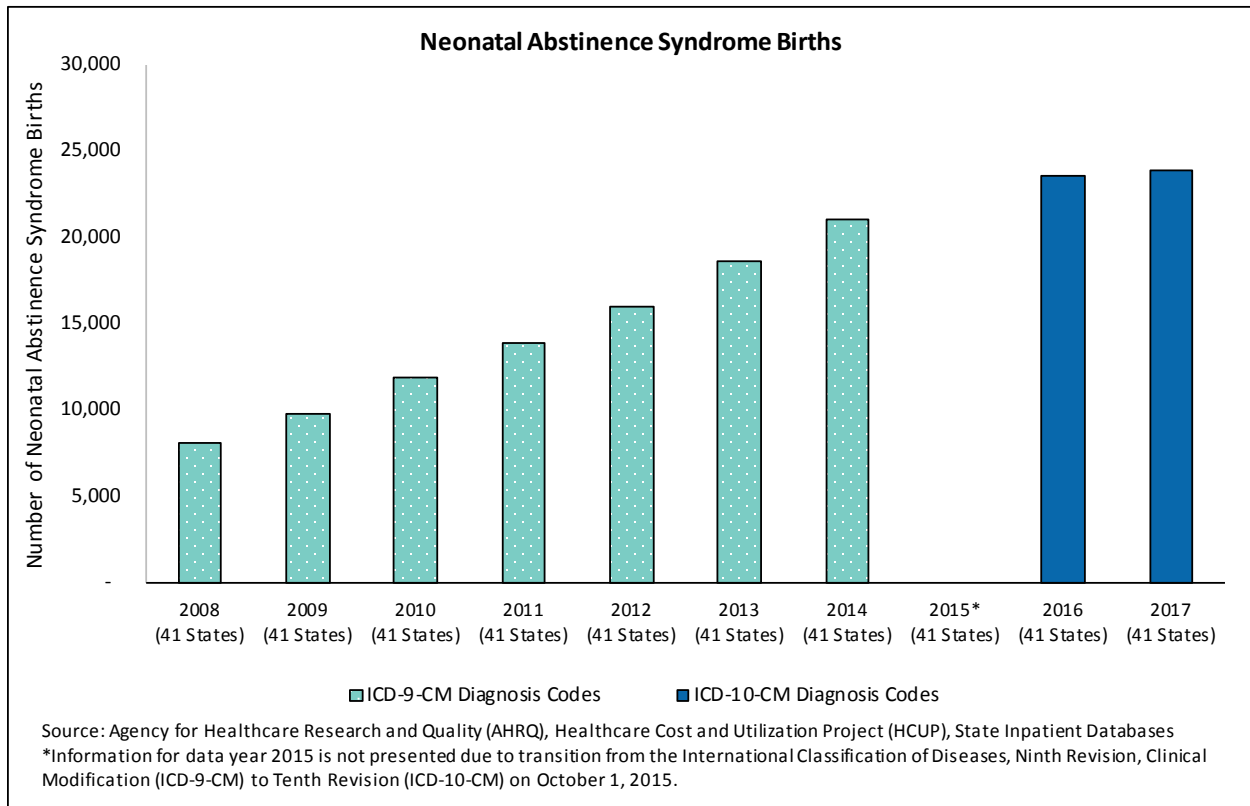
**Figure 2a. Annual Number of Neonatal Abstinence Syndrome Births in the United States in Years 2008–2017 with the Number of HCUP Partner Organizations Varying by Year**



Estimates for 2017 include data from the following: Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

In contrast, Figure 2b includes annual counts for the next data year (2017) with the information limited to 41 States for which HCUP data are available for all years 2008–2017.

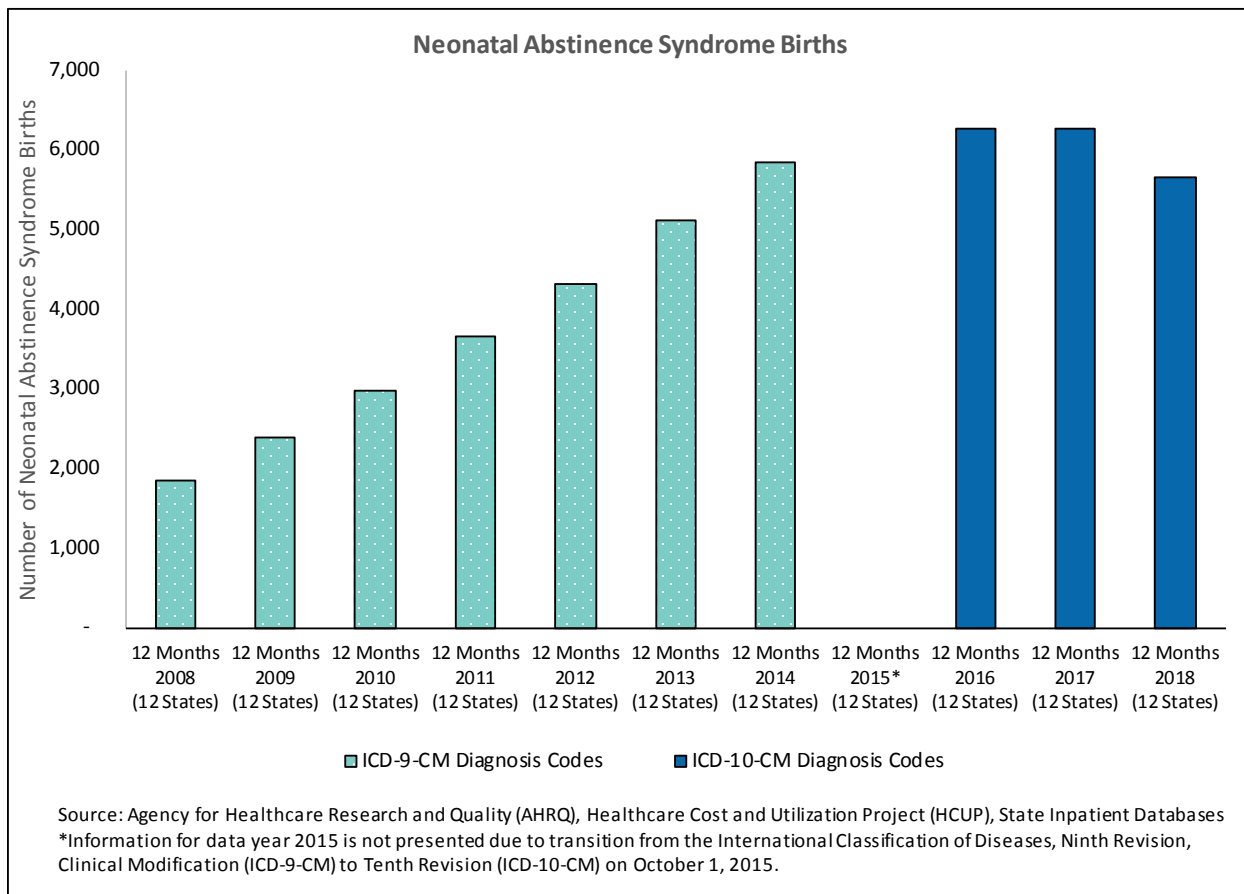
**Figure 2b. Annual Number of Neonatal Abstinence Syndrome Births in the United States in Years 2008–2017, Same HCUP Partner Organizations in All Data Years**



Estimates for 2008–2017 include data from the following in all years: Arizona, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

Figure 3 includes information from the calendar year 2018 (Jan – Dec 2018). The information is limited to 12 States for which HCUP data are available for all years 2008–2018.

**Figure 3. Number of Neonatal Abstinence Syndrome Births in the United States in Twelve Months of Years 2008–2018, Same States in All Data Years**



Estimates for 2008–2018 include data from the following in all years: Arizona, Colorado, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, New Jersey, Ohio, Oregon, and Wisconsin.

## **Appendix A. HCUP Partner Organizations**

**Alaska** Department of Health and Social Services  
**Alaska** State Hospital and Nursing Home Association  
**Arizona** Department of Health Services  
**Arkansas** Department of Health  
**California** Office of Statewide Health Planning and Development  
**Colorado** Hospital Association  
**Connecticut** Hospital Association  
**Delaware** Division of Public Health  
**District of Columbia** Hospital Association  
**Florida** Agency for Health Care Administration  
**Georgia** Hospital Association  
**Hawaii** Health Information Corporation  
**Illinois** Department of Public Health  
**Indiana** Hospital Association  
**Iowa** Hospital Association  
**Kansas** Hospital Association  
**Kentucky** Cabinet for Health and Family Services  
**Louisiana** Department of Health  
**Maine** Health Data Organization  
**Maryland** Health Services Cost Review Commission  
**Massachusetts** Center for Health Information and Analysis  
**Michigan** Health & Hospital Association  
**Minnesota** Hospital Association (provides data for Minnesota and North Dakota)  
**Mississippi** State Department of Health  
**Missouri** Hospital Industry Data Institute  
**Montana** Hospital Association  
**Nebraska** Hospital Association  
**Nevada** Department of Health and Human Services  
**New Hampshire** Department of Health & Human Services  
**New Jersey** Department of Health  
**New Mexico** Department of Health  
**New York** State Department of Health  
**North Carolina** Department of Health and Human Services  
**North Dakota** (data provided by the Minnesota Hospital Association)  
**Ohio** Hospital Association  
**Oklahoma** State Department of Health  
**Oregon** Association of Hospitals and Health Systems  
**Oregon** Office of Health Analytics  
**Pennsylvania** Health Care Cost Containment Council  
**Rhode Island** Department of Health  
**South Carolina** Revenue and Fiscal Affairs Office  
**South Dakota** Association of Healthcare Organizations  
**Tennessee** Hospital Association  
**Texas** Department of State Health Services  
**Utah** Department of Health  
**Vermont** Association of Hospitals and Health Systems  
**Virginia** Health Information  
**Washington** State Department of Health  
**West Virginia** Department of Health and Human Resources, West Virginia Health Care Authority  
**Wisconsin** Department of Health Services  
**Wyoming** Hospital Association

## **Appendix B. Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID)**

The Healthcare Cost and Utilization Project (HCUP) is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, private data organizations, and the Federal government to create a national information resource of encounter-level health care data. HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local market levels.

The HCUP State Inpatient Databases (SID) contain the universe of the inpatient discharge abstracts from participating States that are translated into a uniform format to facilitate multistate comparisons and analyses. Together, the SID encompass over 95 percent of all U.S. hospital discharges.

The SID contain clinical and resource-use information that is included in a typical discharge abstract, with safeguards to protect the privacy of individual patients, physicians, and hospitals. The SID contain more than 100 clinical and nonclinical variables, such as:

- Principal and secondary diagnoses and procedures
- Admission and discharge status
- Patient demographics characteristics (e.g., sex, age, and, for some States, race/ethnicity)
- Expected payment source
- Total charges
- Length of stay.



## Appendix C. Data Tables

Table 1. Annual Number of Neonatal Abstinence Syndrome Births in the United States in Years 2008–2016 with the Number of HCUP Partner Organizations Varying by Year

Year	Number of States and District of Columbia	Time Period	Number of Neonatal Abstinence Syndrome Births in the United States	
			Identified by ICD-9-CM Diagnosis Codes	Identified by ICD-10-CM Diagnosis Codes
2008	43	Calendar year	8,512	0
2009	44	Calendar year	10,380	0
2010	45	Calendar year	12,441	0
2011	46	Calendar year	14,575	0
2012	45	Calendar year	16,709	0
2013	45*	Calendar year	19,569	0
2014	45*	Calendar year	22,061	0
2015**				
2016	48*	Calendar year	0	25,213

Abbreviations: ICD-9-CM: International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM: International Classification of Diseases, Tenth Revision, Clinical Modification.

Notes: Estimates for 2016 include data from the following: Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

\* Count includes States and the District of Columbia.

\*\*Information for data year 2015 is not presented due to transition from the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) to Tenth Revision (ICD-10-CM) on October 1, 2015.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases, 2008–2016

Table 2a. Annual Number of Neonatal Abstinence Syndrome Births in the United States in Years 2008–2017 with the Number of HCUP Partner Organizations Varying by Year

Year	Number of States and District of Columbia	Time Period	Number of Neonatal Abstinence Syndrome Births in the United States	
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2012	45	Calendar year	16,709	0
2013	45*	Calendar year	19,569	0
2014	45*	Calendar year	22,061	0
2015**				
2016	48*	Calendar year	0	25,213
2017	47*	Calendar year	0	24,532

Abbreviations: ICD-9-CM: International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM: International Classification of Diseases, Tenth Revision, Clinical Modification.

Notes: Estimates for 2017 include data from the following: Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

\* Count includes States and the District of Columbia.

\*\*Information for data year 2015 is not presented due to transition from the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) to Tenth Revision (ICD-10-CM) on October 1, 2015.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases, 2008–2017

Table 2b. Annual Number of Neonatal Abstinence Syndrome Births in the United States in Years 2008–2017, Same HCUP Partner Organizations in All Data Years

Year	Number of States and District of Columbia	Time Period	Number of Neonatal Abstinence Syndrome Births in the United States	
			Identified by ICD-9-CM Diagnosis Codes	Identified by ICD-10-CM Diagnosis Codes
2008	41	Calendar year	8,073	0
2009	41	Calendar year	9,803	0
2010	41	Calendar year	11,899	0
2011	41	Calendar year	13,826	0
2012	41	Calendar year	15,945	0
2013	41	Calendar year	18,613	0
2014	41	Calendar year	21,060	0
2015*				
2016	41	Calendar year	0	23,529
2017	41	Calendar year	0	23,924

Abbreviations: ICD-9-CM: International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM: International Classification of Diseases, Tenth Revision, Clinical Modification.

Notes: Estimates for 2008–2017 include data from the following in all years: Arizona, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

\*Information for data year 2015 is not presented due to transition from the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) to Tenth Revision (ICD-10-CM) on October 1, 2015.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases, 2008–2017

Table 3. Number of Neonatal Abstinence Syndrome Births in the United States in Years 2008–2018, Same States in All Data Years

Year	Number of States and District of Columbia	Time Period	Number of Neonatal Abstinence Syndrome Births in the United States	
			Identified by ICD-9-CM Diagnosis Codes	Identified by ICD-10-CM Diagnosis Codes
2008	12	Calendar year	1,848	0
2009	12	Calendar year	2,398	0
2010	12	Calendar year	2,970	0
2011	12	Calendar year	3,664	0
2012	12	Calendar year	4,324	0
2013	12	Calendar year	5,107	0
2014	12	Calendar year	5,844	0
2015*				
2016	12	Calendar year	0	6,263
2017	12	Calendar year	0	6,255
2018	12	Calendar year	0	5,643

Abbreviations: ICD-9-CM: International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM: International Classification of Diseases, Tenth Revision, Clinical Modification.

Notes: Estimates for 2008–2018 include data from the following in all years: Arizona, Colorado, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, New Jersey, Ohio, Oregon, and Wisconsin.

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Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases, 2008–2018