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Background: Neonatal abstinence syndrome (NAS) is a drug withdrawal syndrome experienced by some opioid-exposed infants. The national rate of NAS has increased in parallel with other opioid-related complications; however, published data are limited in describing both historic and recent trends.

Objectives: To describe national rates of NAS in the US from 1993 to 2014 and examine geographic variation from 2012 to 2014.

Methods: Diagnostic data from the Agency for Healthcare Research and Quality’s Healthcare Cost and Utilization Project (HCUP) were analyzed through the public access online query system, HCUPnet. Using the National Inpatient Sample, we examined trends in cases of NAS based on International Classification of Diseases - 9th revision - Clinical Modification (ICD-9-CM) code 779.5 (drug withdrawal syndrome in newborn). Weighted national estimates of the total number of discharges and the rate of discharges (per 100,000 persons) were examined for 1993 through 2014. Z-test analysis assessed for differences in the rate of discharges across time for the complex survey sample. Discharge rates by US Census Bureau Division (2012 through 2014 only) were also examined (only years available).

Results: In 1993, there were 8,511 (95% CI: 5,277-11,746) discharges for NAS nationally; by 2014 the number rose dramatically to 31,245 (95% CI: 28,389-34,101). While the rate of NAS was stable in the 1990s, it increased from 2003 to 2012 (1.7 vs. 7.3, p<.001; see Figure 1). Since 2012, the national NAS discharge rate has significantly increased each year, reaching 9.8 per 100,000 persons in 2014.

In the 3 most recent years of data, discharge rates increased among all US Census Bureau Divisions (Figure 2). In 2014, the East South Central Division (Alabama, Kentucky, Mississippi, and Tennessee) and the New England Division (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) had much higher rates (31.1 and 18.2, respectively) compared to other Divisions and the US overall.

Conclusion: The rate of discharges for NAS in the US has increased dramatically since 2003, particularly in the regions of the country with the highest rates of opioid-related complications - East South Central and New England Divisions of the US. As federal and state governments implement opioid-related policies, they should be mindful of the impact it continues to have on maternal and child health.
Figure 1: US Neonatal Abstinence Syndrome Discharge Rates, 1993-2014

Note: Error bars display 95% Confidence Intervals

Figure 2: Neonatal Abstinence Syndrome Discharge Rates by US Census Division, 2012-2014