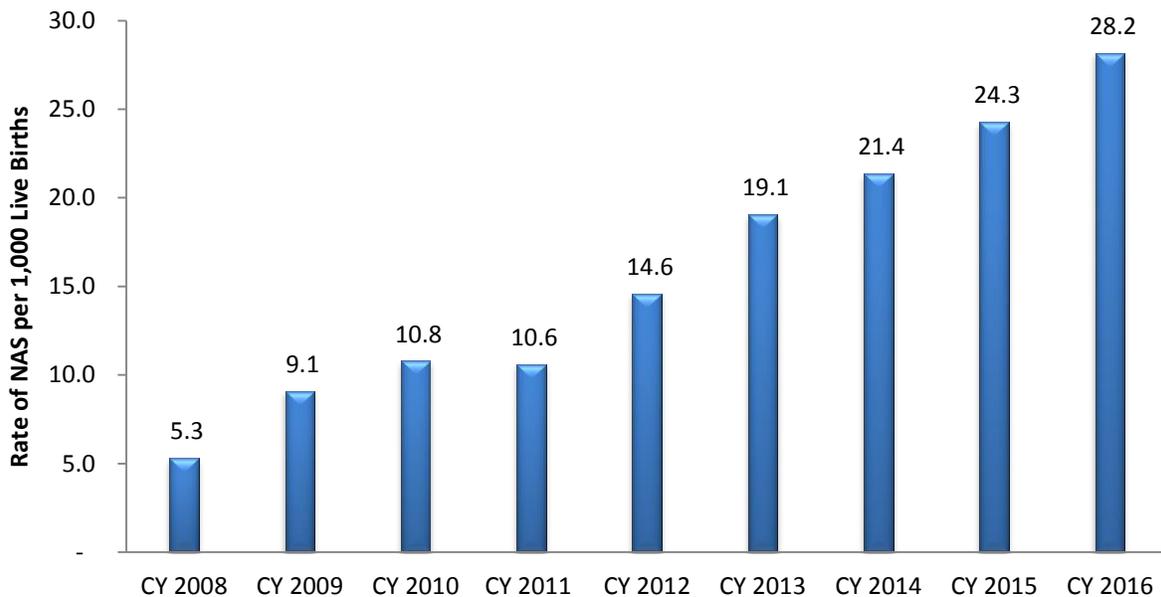


## Neonatal Abstinence Syndrome among TennCare enrollees - 2016 data

Cases of neonatal abstinence syndrome (NAS) were identified based on the presence of ICD10 codes P96.1 and P96.2 occurring during the first year of life<sup>1</sup>. Each calendar year cohort was restricted to children born in the specified year. TennCare eligibility status was determined using TennCare’s Interchange system. Cases were identified from infants that were eligible at time of birth or enrolled in TennCare during their first year of life. Live births, used as the denominator, were determined based on a linkage of vital statistics records and TennCare Interchange records.

**Figure 1: Incidence of Neonatal Abstinence Syndrome among TennCare Enrollees**



As Figure 1 illustrates above, there was an increase in the incidence rate of NAS per 1,000 live births among TennCare recipients from CY 2008 through CY 2016. The number of TennCare births did not change dramatically from CY 2008 to CY 2016. There was a decrease of 2.3% in births from CY 2015 to CY 2016 and a 13.4% increase in NAS cases for the same period.

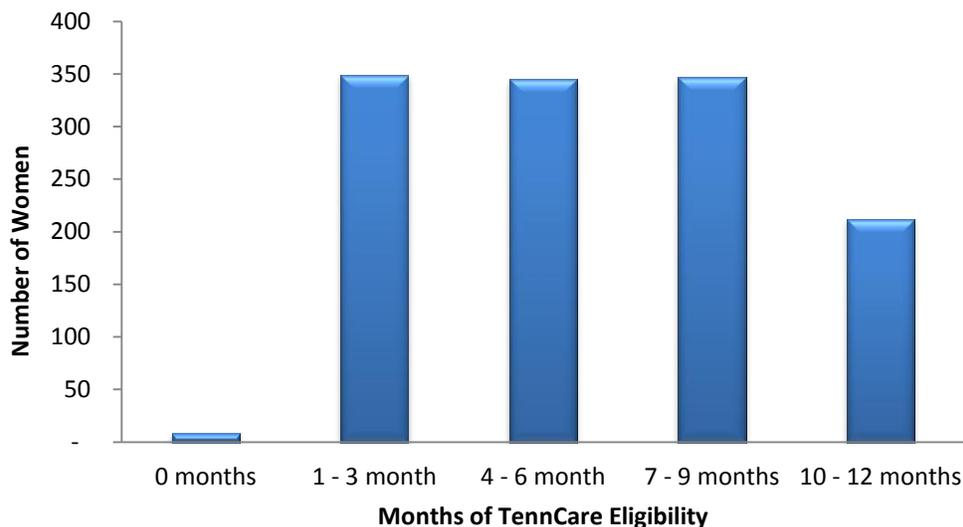
<sup>1</sup> (def) Drug withdrawal syndrome in a newborn, excluding fetal alcohol syndrome.

**Table 1: 2016 NAS Mother’s TennCare Status at Time of Delivery**

Calendar Year	TennCare Newborns Treated for NAS During Year	Mothers on TennCare at Time of TennCare NAS Birth	Percent of TennCare NAS Infants Born to TennCare Mothers	Mothers NOT on TennCare at Time of TennCare NAS Birth	Percent of TennCare NAS Infants NOT Born to TennCare Mothers
2008	264	229	87%	35	13%
2009	444	335	75%	109	25%
2010	512	424	83%	88	17%
2011	528	483	91%	45	9%
2012	736	613	83%	123	17%
2013	943	823	87%	120	13%
2014	1,101	1,017	92%	84	8%
2015	1,197	1,098	92%	99	8%
2016	1,357	1,261	93%	96	7%

Table 1 presents information regarding the TennCare status of mothers of TennCare NAS infants at the time of birth. In 2016, the most recent calendar year of complete data, 93% of TennCare NAS children were born to mothers who were on TennCare at the time of delivery; the remaining 7% were born to mothers not on TennCare at the time of delivery.

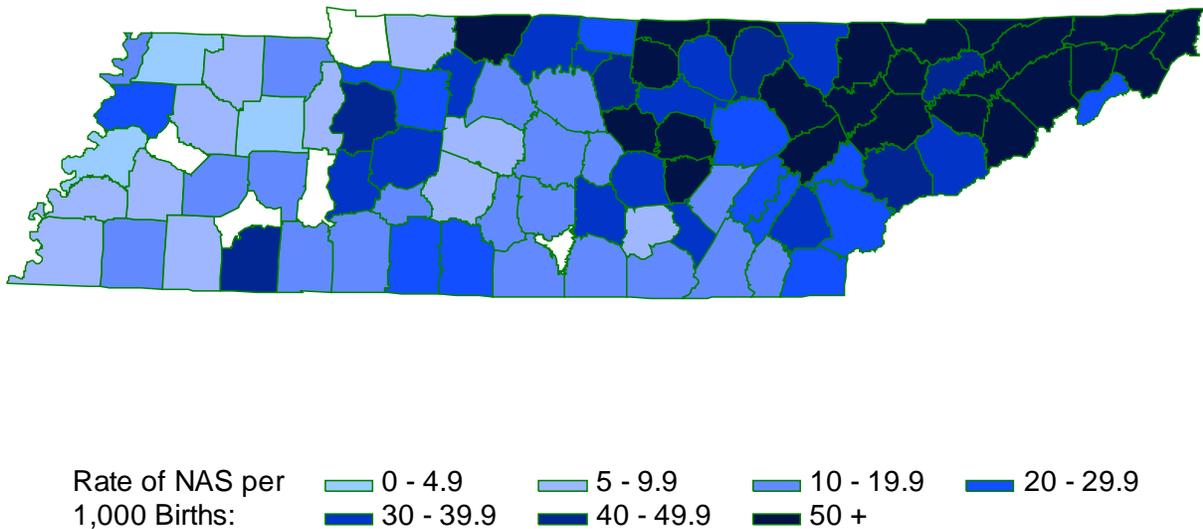
**Figure 2: Length of Prior Year’s Eligibility for 2016 TennCare NAS Mothers**



For each woman with a TennCare child diagnosed with NAS in CY 2016, the length of eligibility for the mother within a 12 month period prior to the child’s birth was determined (Figure 2). There were a total

of 8 women with no TennCare eligibility in the year prior to the child’s birth. Close to 44.3% of the women with NAS children had TennCare eligibility 7 or more months prior to the child’s delivery.

**Map 1: Incidence of NAS among TennCare Recipients - 2016**



SOURCE: Division OF TENNCARE 02APR18

In order to visualize the relative incidence of NAS by county, rates were plotted on a map of the state of Tennessee (Map 1). For the purpose of calculating county level rates, the county of residence for the infant was based on the address of the mother at the time of delivery. Live births were used as the denominator. The degree of regional variation is dramatic, with the majority of NAS cases in east Tennessee. During 2016, Hancock County had the highest county level of incidence with 180.3 NAS births per 1,000 live infants. The county with the highest number of NAS births was Knox County with 143 NAS infants in CY 2016. The regional pattern is similar to the pattern seen with TennCare recipient emergency department visits for prescription drug abuse related overdoses, where rates are considerably higher in east and middle Tennessee than in the western part of the state.

**Figure 3: Demographic Characteristics of 2016 NAS mothers**

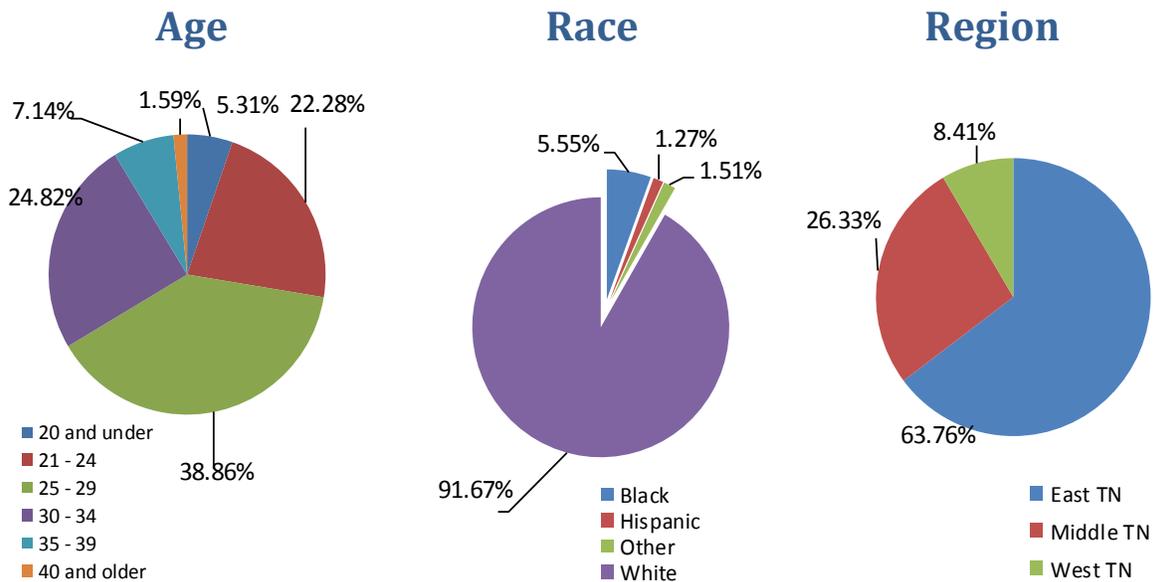


Figure 3 displays basic demographic characteristics of mothers who had some period of TennCare eligibility in the year prior to the birth of a NAS infant in CY 2016. Just over 86% of the NAS mothers are between the ages of 21 and 34, a slight increase from the previous year (84%). And about 64% of the women have a county of residence in east Tennessee. Almost 92% of all mothers with a NAS infant treated by TennCare were White Non-Hispanic.

**Table 2: Impact of NAS on infant health care expenditures<sup>2</sup> - 2016 data**

Metric	All TennCare paid live births	All TennCare non-low birth weight births	All TennCare live low birth weight births	NAS babies
Number of births	47,156	42,039	5,117	1,349
Total costs for infants in first year of life	\$393,730,307	\$212,066,496	\$181,663,811	\$54,191,165
Average cost per child	\$8,350	\$5,045	\$35,502	\$40,171
Average length of stay (days)	3.6	2.1	15.9	19.5

<sup>2</sup> Includes all expenditures paid through the first year of life. Totals are subject to change based on updated data.

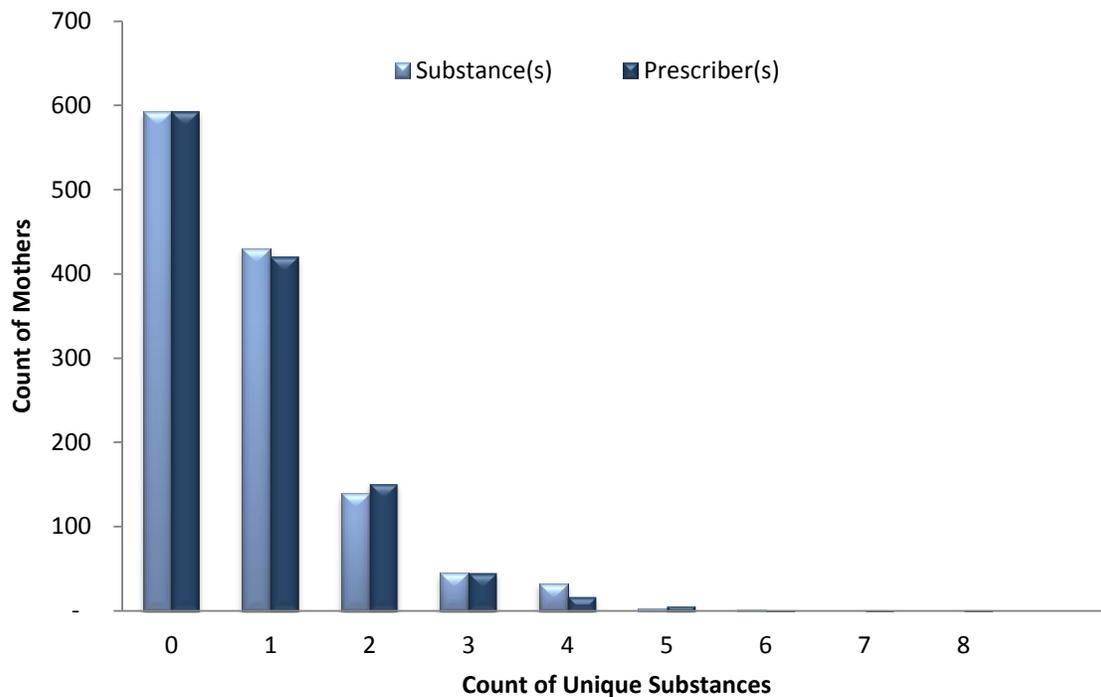
To determine the financial impact of NAS relative to all births, TennCare’s Interchange system was used to quantify expenditures for live born infants in the first year of life (Table 2). In CY 2016 the average cost of care for a NAS infant in the first year of life is more than 8.0 times higher than the average cost of care for normal birth weight infants and approximately 1.1 times higher than the average cost of care for low birth weight infants.

**Table 3: Percentage of newborns in DCS custody within one year of birth - 2016 data**

Metric	All Infants	NAS infants
Total Number of Infants	52,077	1,357
Number Infants in DCS Custody	689	204
Percent of Infants in DCS	1.3%	15.0%

Using TennCare eligibility records it was determined that 204 of the 1,357 infants diagnosed with NAS in CY 2016 (15.0%) were placed in DCS custody within one year of their birth. Among all TennCare infants born in CY 2016, 1.3% were placed in DCS within one year of birth (Table 3). Infants born with NAS are about 11.4 times more likely to be in DCS custody during their first year of life as compared with other TennCare infants.

**Figure 4: Number of Substances and Prescribers Paid by TennCare for 2016 NAS Mothers**



In addition to the custody status of children, the TennCare-paid prescription narcotic analgesic history of women giving birth to NAS babies was determined. All opioid claims up to one year prior to birth for any woman with a NAS child were evaluated (Figure 4)<sup>3</sup>. Among NAS mothers with at least one opioid prescription paid by TennCare, the average number of unique substances prescribed was 1.5, a 16% decrease from the previous year’s average of 1.8 substances per NAS mother with at least one opioid prescription paid by TennCare. Overall, a total of 4,102 prescriptions for narcotics were issued for women with NAS babies. Figure 4 above illustrates the numbers of NAS mothers with TennCare-paid prescriptions for varying numbers of narcotic substances<sup>4</sup> as well as the number of prescribers. Among NAS mothers with at least one opioid prescription paid by TennCare, each mother had on average 1.5 unique prescribers<sup>5</sup> of narcotics in the year period. Approximately 41% of women with NAS babies who received narcotics paid for by TennCare appeared to be receiving treatment for opioid dependence/addiction<sup>6</sup>; however, it is important to note that TennCare does not cover methadone clinic

<sup>3</sup> Any pharmacy claim with an NDC correlation to the following HIC3 codes was considered an opioid: H3A, H3H, H3J, H3M, H3N, H3R, H3T, H3U, H3W or H3X.

<sup>4</sup> “Substances” were determined based on the first 9 digits of the NDC code

<sup>5</sup> Determined based on unique NPI numbers of the prescribing doctor

<sup>6</sup> Includes Therapeutic Class codes H3T (Narcotic Antagonists such as Naltrexone) and H3W (Narcotic Withdrawal Therapy Agents such as Buprenorphine)

services, so to the extent some of these women were receiving methadone maintenance therapy, claims for those services would not be included in this count. Additionally, this does not account for services provided in an institutional setting, such as an inpatient hospital, or other forms of addiction treatment where a separate pharmacy claim does not exist.

**Table 4: Narcotic analgesic and contraceptive use among all TennCare women - 2016 data**

Demographics	TennCare Women	Women Prescribed Narcotics (>30 days supplied)	Narcotic Users Rate per 1,000	Women Prescribed Contraceptives and Narcotics	% of Women on Narcotics and Contraceptives	Women Prescribed Narcotics without Contraceptives	% of Women on Narcotics Not on Contraceptives
<b>All Women</b>							
<b>15 - 44</b>	<b>407,282</b>	<b>32,408</b>	<b>80</b>	<b>4,694</b>	<b>14%</b>	<b>27,714</b>	<b>86%</b>
15 - 20	101,518	653	6	291	45%	362	55%
21 - 24	59,475	1,761	30	523	30%	1,238	70%
25 - 29	77,487	4,994	64	1,215	24%	3,779	76%
30 - 34	68,519	7,641	112	1,228	16%	6,413	84%
35 - 39	58,669	9,029	154	946	10%	8,083	90%
40 - 44	41,613	8,330	200	491	6%	7,839	94%

Note: Voluntary Reversible Long Acting Contraceptives (VRLAC) was not included in the table above; future reports anticipated to include members receiving forms of long – acting contraceptives in the numerator for this metric. This metric also does not account for permanent forms of contraception such as tubal ligation or hysterectomy.

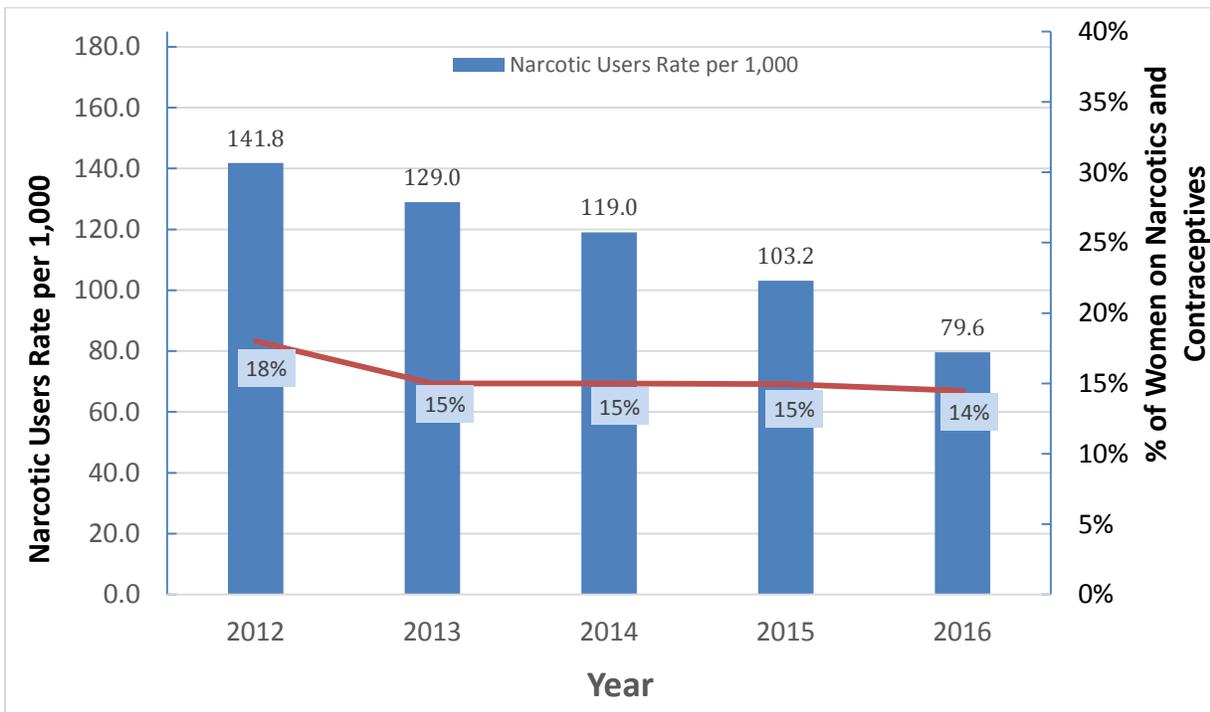
The rate of women using prescribed narcotic analgesics and contraceptive medications was determined in CY 2016 (Table 4). The analysis was limited only to women of child-bearing age (15 – 44). The drug histories of TennCare women of child-bearing age were evaluated for the presence of narcotic analgesics and contraceptive products<sup>7</sup>. Women were excluded from the analysis if they had narcotic prescriptions totaling less than 30 days in CY 2016.

As Table 4 indicates, approximately 14% of women of child-bearing age who are prescribed narcotic analgesics are also prescribed some form of contraceptive, consistent with previous years. The overall rate of prescription narcotic utilization among women aged 15-44 is 80 narcotic users per 1,000 eligible women, a 22% decrease compared to previous year (see Figure 5 below). The data above indicates that

<sup>7</sup> Any pharmacy claim with an NDC correlating to any HIC3 codes of G8A, G8B or G8C was considered a contraceptive.

approximately 27,714 women ages 15-44 are using narcotics for more than 30 days a year and are not on some form of contraceptive paid for by TennCare. Among women ages 15-44 using narcotics for more than 30 days a year, women ages 15-24 are the most likely to have contraceptive and narcotic prescriptions (34%) when compared with other age ranges.

**Figure 5: Narcotics and contraceptives trends for TennCare women – 2016 data**



Based on the 5-year data regarding the utilization of narcotics and contraceptives among TennCare women aged 15 to 44 years old, the rate of opioid users per 1,000 women continuously decreased during 2012-2016. Figure 5 shows a 44% decrease in the narcotics users' rate in 2016 (79.6 per 1,000 women) compared to the rate in 2012 (141.8), as well as a slight decrease in the percentage of women prescribed on both narcotics and contraceptives.