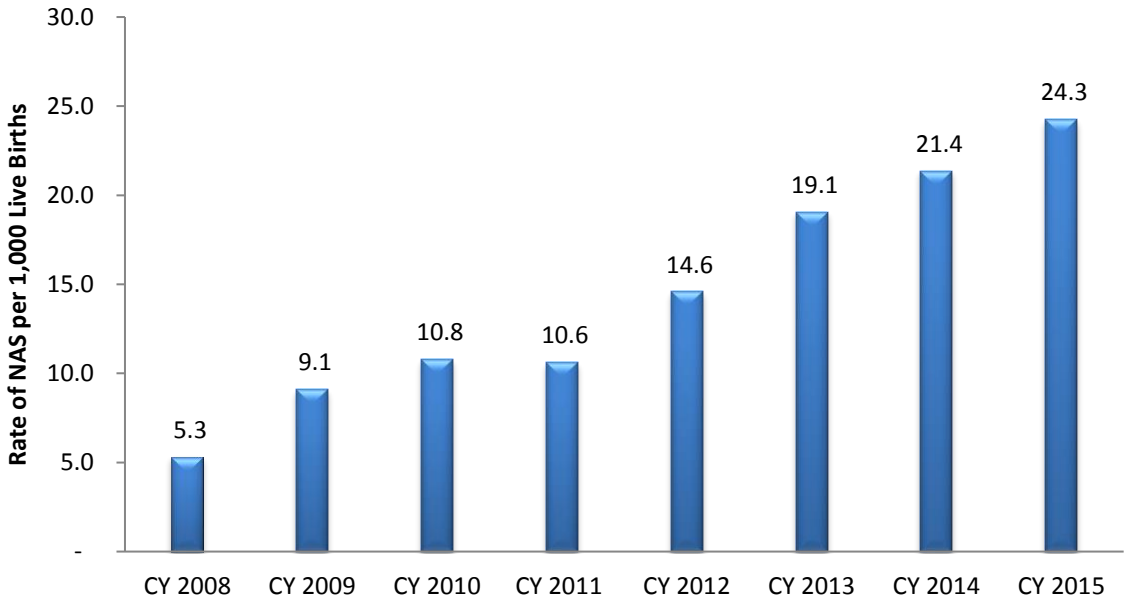
Division of Health Care Finance & Administration

Neonatal Abstinence Syndrome among TennCare enrollees - 2015 data

Cases of neonatal abstinence syndrome (NAS) were identified based on the presence of ICD-9 code 779.5 and ICD10 codes P96.1 and P96.2 occurring during the first year of life[1]. 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 2015. The number of TennCare births did not change dramatically from CY 2008 to CY 2015. There was a decrease of 1.3% in births from CY 2014 to CY 2015 and a 12.2% increase in NAS cases for the same period.

[1] (def) Drug withdrawal syndrome in a newborn, excluding fetal alcohol syndrome.

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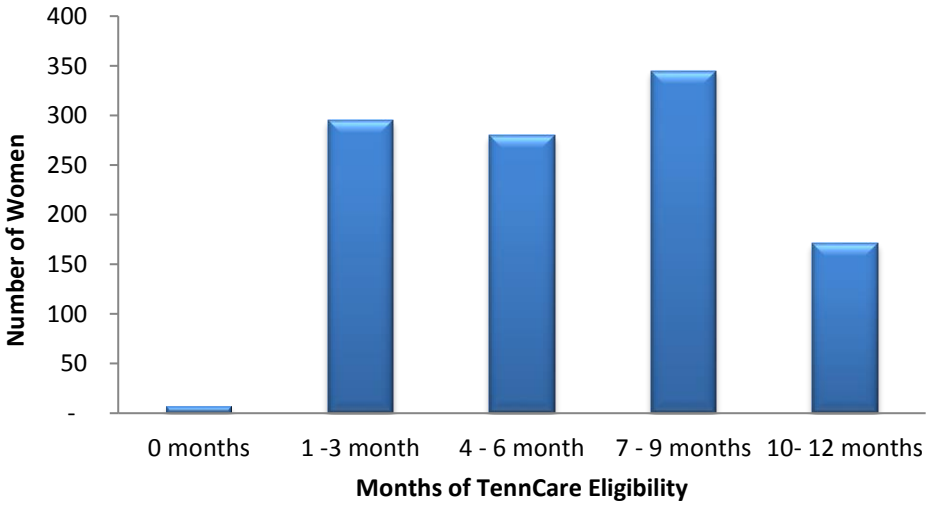
Table 1: Mother's TennCare status at time of delivery for NAS children - 2015 data

YEAR	TennCare Newborns treated for NAS during year	Mothers on TennCare at birth	Percent of NAS children	Mothers not on TennCare at birth	Percent of NAS Infants
CY 2008	264	229	87%	35	13%
CY 2009	444	335	75%	109	25%
CY 2010	512	424	83%	88	17%
CY 2011	528	483	91%	45	9%
CY 2012	736	613	83%	123	17%
CY 2013	943	823	87%	120	13%
CY 2014	1,101	1,017	92%	84	8%
CY 2015	1,197	1,098	92%	99	8%

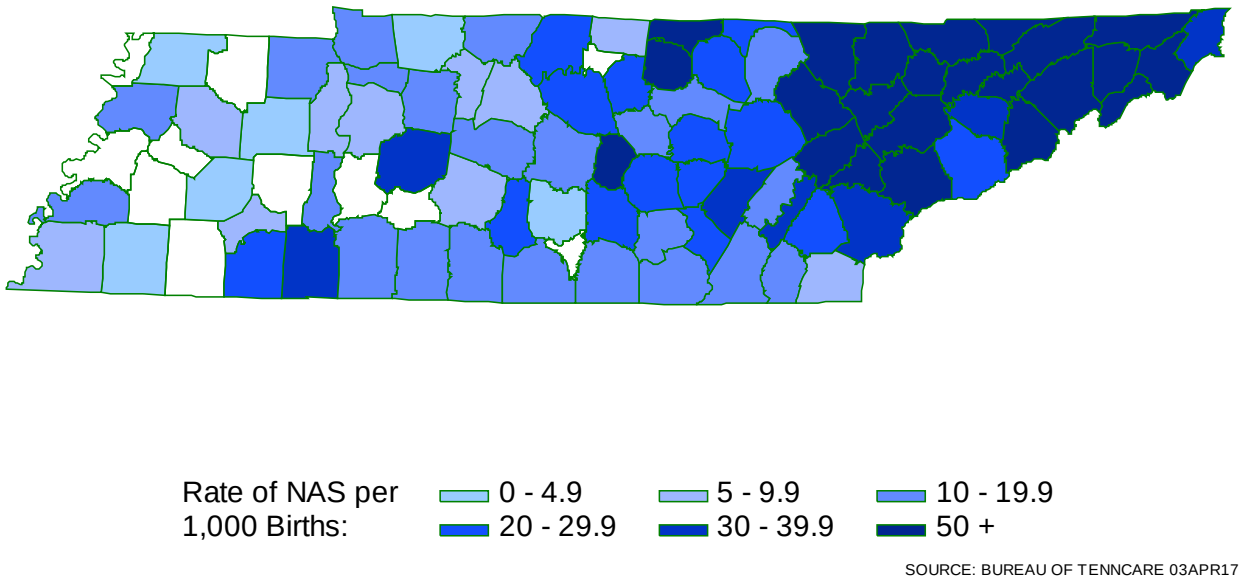
Table 1 presents information regarding the TennCare status of mothers of NAS infants at the time of birth. Across the eight-year period, at least 88% of NAS children were born to mothers on TennCare at the time of delivery. The remaining 12% includes infants eligible at birth and infants determined eligible after birth, but during the first year of life.

Figure 2: Mother's length of TennCare eligibility in year prior to birth - 2015 data



For each woman with a TennCare child diagnosed with NAS in CY 2015, 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 7 women with no TennCare eligibility in the year prior to the child's birth. Close to 47.0% 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 - 2015 data



SOURCE: BUREAU OF TENNCARE 03APR17

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 2015, Hancock County had the highest county level of incidence with 141 NAS births per 1,000 live infants. The county with the highest number of NAS births was Knox County with 149 NAS infants in CY 2015. 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 NAS mothers - 2015 data

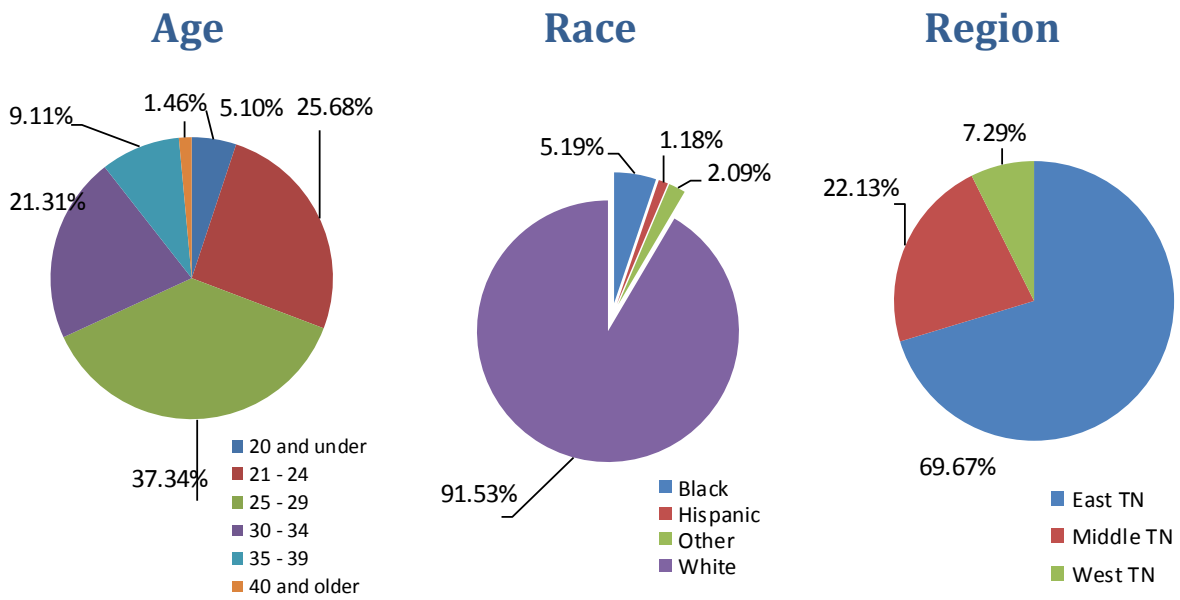


Figure 3 displays basic demographic characteristics of mothers who had some period of TennCare eligibility in the year prior to the birth of a NAS infant in CY 2015. Just over 84% of the NAS mothers are between the ages of 21 and 34, a slight decrease from the previous year (85%). And just over 70% of the women have a county of residence in east Tennessee. Almost 92% of all mothers with a NAS infant treated by TennCare where White Non-Hispanic.

Table 2: Impact of NAS on infant health care expenditures[2] - 2015 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	46,900	41,842	5,058	1,197
Total costs for infants in first year of life	$398,346,174	$198,818,408	$199,527,766	$53,043,353
Average cost per child	$8,494	$4,752	$39,448	$44,314
Average length of stay (days)	3.5	2.0	15.4	21.0

[2] Includes all expenditures paid through 12/31/2016. Totals are subject to change based on updated data.

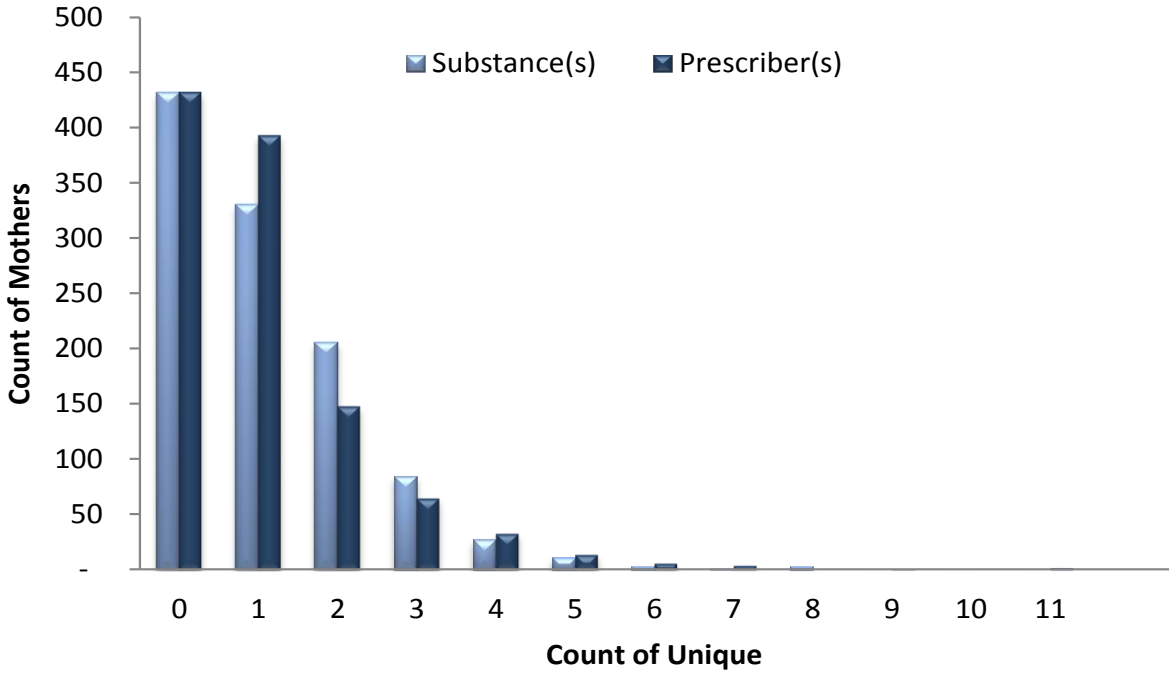
To determine the financial impact of NAS relative to all births, TennCare's Interchange system was used to quantify expenditures for live born infants in the first year of life (Table 2). In CY 2015 the average cost of care for a NAS infant in the first year of life is more than 9.3 times higher than 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 - 2015 data

Metric	All Infants	NAS infants
Total # of Infants	52,114	1,197
Total # infants in DCS	694	178
% in DCS	1.3%	14.9%

Using TennCare eligibility records it was determined that 178 of the 1,197 infants diagnosed with NAS in CY 2015 (14.9%) were placed in DCS custody within one year of their birth, a 15% decrease from CY 2014. Among all TennCare infants born in CY 2015, 1.3% were placed in DCS within one year of birth (Table 3). Infants born with NAS are 11 times more likely to be in DCS custody during their first year of life as compared with other TennCare infants.

Figure 4: TennCare-paid narcotic prescriptions for TennCare NAS mothers – 2015 data



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 narcotic claims for any woman with a NAS child up to one year prior to birth were evaluated (Figure 4)[3]. The average number of claims per woman with a prescription was 2.3, an 8% decrease from the previous year. A total of 4,623 prescriptions for narcotics were issued for women with NAS babies. Figure 4 above illustrates the numbers of women with TennCare-paid prescriptions for varying numbers of narcotic substances[4] as well as the number of prescribers. On average, women had 2.3 unique prescribers[5] of narcotics in the year period. Approximately 48% of women with NAS babies who received narcotics paid for by TennCare appeared to be receiving treatment for opioid dependence/addiction[6]; however, it is important to note that TennCare does not cover methadone clinic 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.

[3] Any pharmacy claim with an NDC correlation to any HIC3 codes of H3A,H3H,H3J,H3M,H3N,H3R,H3T,H3U,H3W or H3X was considered a prescription narcotic.

[4] "Substances" were determined based on the first 9 digits of the NDC code

[5] Determined based on unique NPI numbers of the prescribing doctor

[6] Includes Buprenorphine formulations.

Table 4: Narcotic analgesic and contraceptive use among all TennCare women - 2015 data

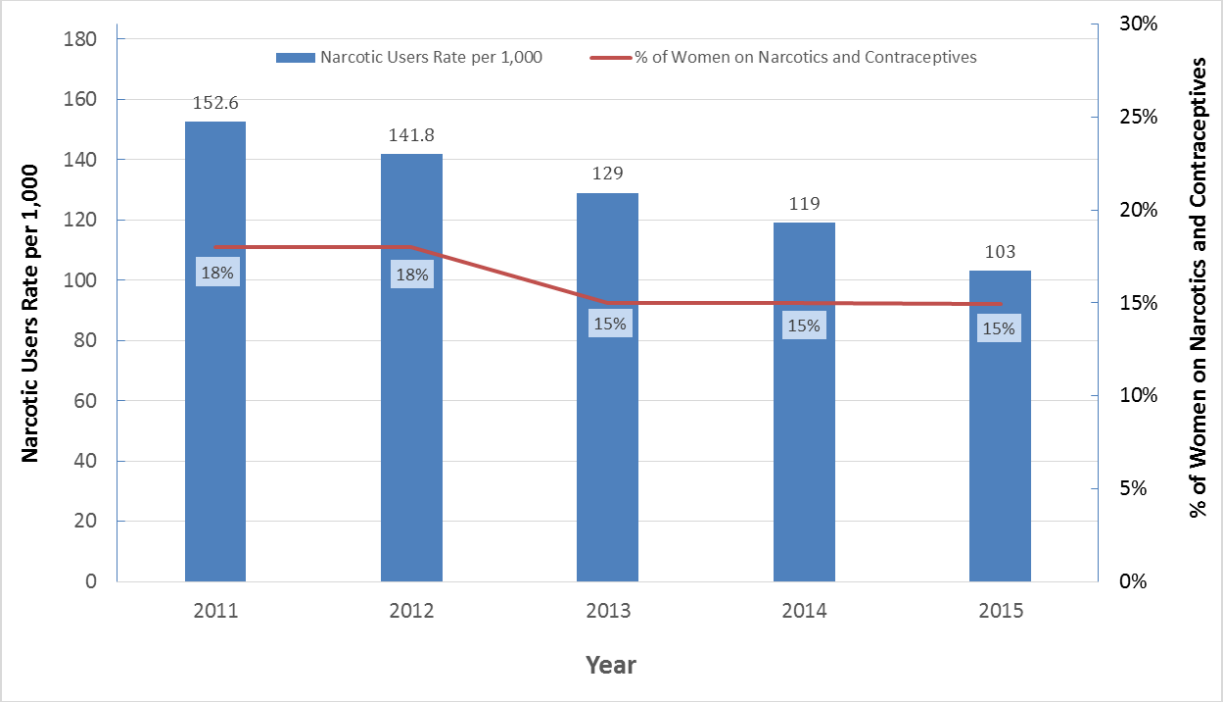
Demographics	TennCare Women	Women Prescribed Narcotics (>30 days supplied)	Narcotic Users Rate per 1,000	Women Prescribed Contraceptives and Narcotics	% of Women on Narcotics and Contraceptives	Women Prescribed Narcotics without Contraceptives	% of Women on Narcotics Not on Contraceptives
All Women	**374,851**	**38,671**	**103**	**5,785**	**15%**	**32,886**	**85%**
15 - 20	95,167	1,103	12	449	41%	654	59%
21 - 24	58,103	2,644	46	765	29%	1,879	71%
25 - 29	70,419	6,741	96	1,551	23%	5,190	77%
30 - 34	62,298	9,470	152	1,552	16%	7,918	84%
35 - 39	51,731	9,915	192	976	10%	8,939	90%
40 - 44	37,131	8,798	237	492	6%	8,306	94%

The rate of women using prescribed narcotic analgesics and contraceptive medications was determined in CY 2015 (Table 4). The analysis was limited only to women of child bearing age (15 – 44). The drug history of TennCare women of child bearing age was evaluated for the presence of narcotic analgesics and contraceptive products[7]. Women were excluded from the analysis if they had narcotic prescriptions totaling less than 30 days in CY 2015.

As Table 4 indicates approximately 15% of women of child bearing age that are prescribed narcotic analgesics are also prescribed some form of contraceptive, consistent with previous years. The overall rate of prescription narcotic utilization among women and 15-44 is 103 users per 1,000 eligible women, a 13% decrease compared to previous year. The data above indicates that approximately 32,886 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 (32%) when compared with other age ranges.

[7] Any pharmacy claim with an NDC correlating to any HIC3 codes of G8A, G8B or G8C was considered a contraceptive.

Figure 5: Narcotics and contraceptives trends for TennCare women – 2015 data



Based on the 5-year data regarding the utilization of narcotics and contraceptives among TennCare women aged 15 to 44 years old, the narcotics users' rate per 1,000 women continuous decreased during 2011-2015. Figure 5 shows a 32% decrease in the narcotics users' rate in 2015 (103.2 per 1,000 women) compared to the rate in 2011 (152.6), as well as a slight decrease in the percentage of women prescribed on both narcotics and contraceptives.