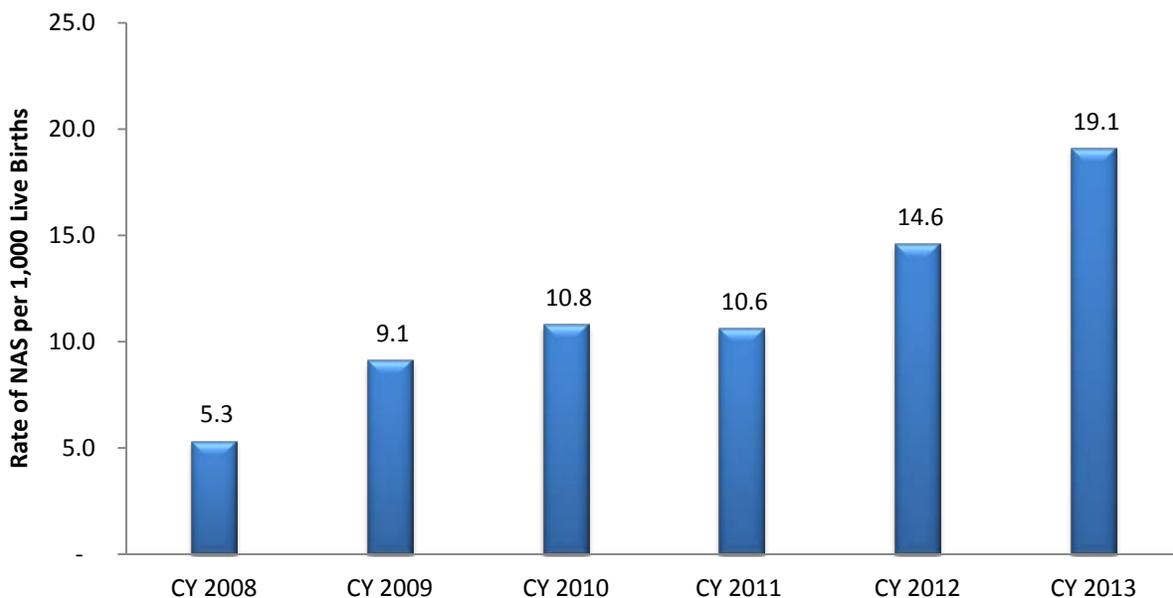


Neonatal Abstinence Syndrome among TennCare enrollees - 2013 data

Cases of neonatal abstinence syndrome (NAS) were identified based on the presence of ICD-9 code 779.5 occurring during the first year of life. 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



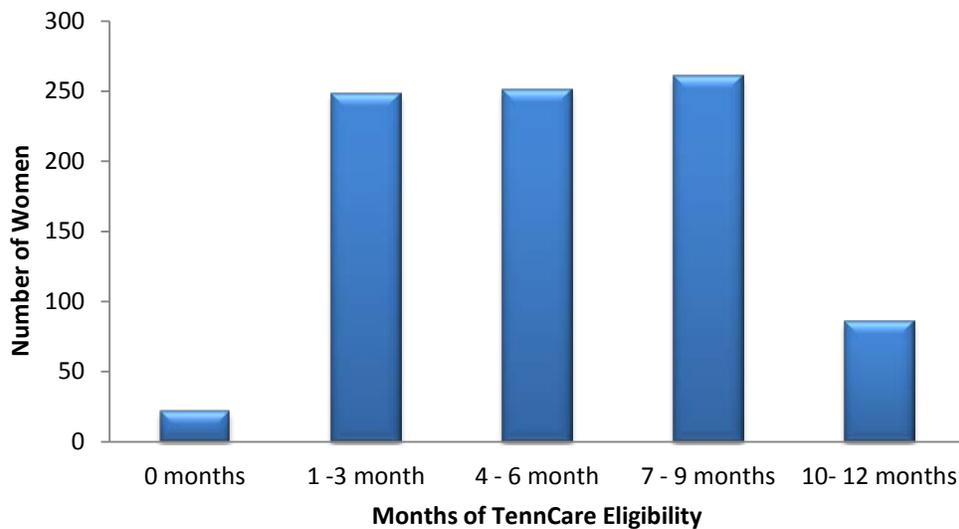
As Figure 1 illustrates, there was an increase in the incidence rate of NAS among TennCare recipients from CY 2008 through CY 2013. The number of TennCare births did not change dramatically from CY 2008 – CY 2013. There was a decrease of 1.3% in births from CY 2012 to CY 2013 and a 29% increase in NAS cases for the same period.

Table 1: Mother’s TennCare status at time of delivery for NAS children - 2013 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 children ²
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%

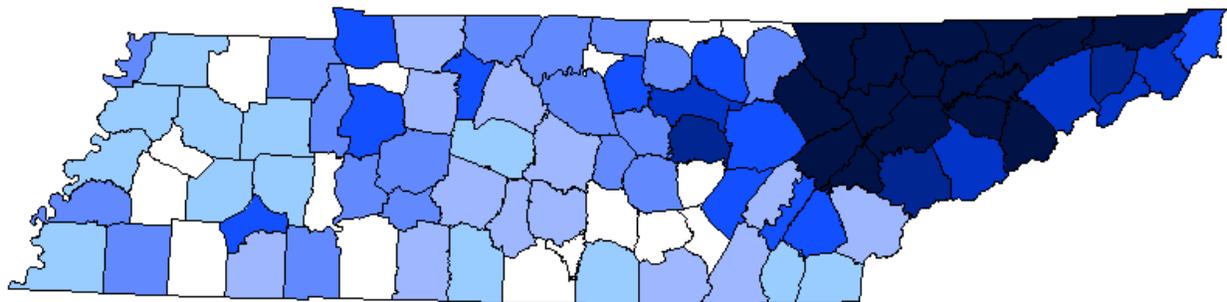
Table 1 presents information regarding the TennCare status of mothers of NAS infants at the time of birth. Across the six-year period, at least 85% of NAS children were born to mothers on TennCare at the time of delivery. The remaining 15% includes infants eligible at birth and infants determined eligible after birth, but during the first year of life.

Figure 2: Mother’s length of TennCare eligibility in year prior to birth - 2013 data



For each woman with a TennCare child diagnosed with NAS in CY 2013, the length of eligibility for the mother within a 12 month period prior to the child’s birth was determined. There were a total of 22 women with no TennCare eligibility in the year prior to the child’s birth. Close to 37% 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 - 2013 data



Rate of NAS per 1,000 Births:
 0 - 4.9
 5 - 9.9
 10 - 19.9
 20 - 29.9
 30 - 39.9
 40 - 49.9
 50 +

SOURCE: BUREAU OF TENNCARE 27OCT15

In order to visualize the relative incidence of NAS by county, rates were plotted on a map of the state of Tennessee. 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 2013, Hawkins County had the highest county level of incidence with 104 NAS births per 1,000 live infants. The county with the highest number of NAS births was Knox County with 142 NAS infants in CY 2013. 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 - 2013 data

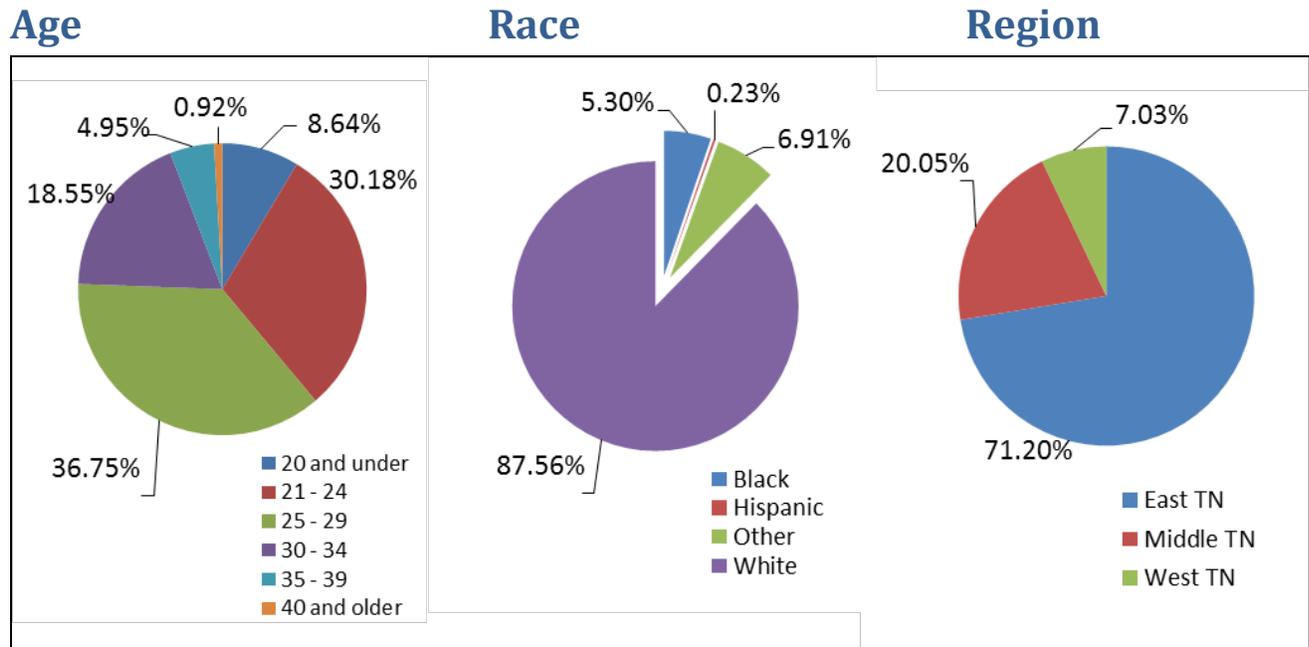


Figure 3 displays basic demographic characteristics of mothers who had some period of TennCare eligibility in the year prior to the birth of a NAS infant in CY 2013. Just over 88% of the NAS mothers are between the ages of 21 and 34, a slight increase from the previous year (87%). And just over 73% of the women have a county of residence in east Tennessee. Slightly more than 87% of all mothers with a NAS infant treated by TennCare were White Non-Hispanic.

Table 2: Impact of NAS on infant health care expenditures¹ - 2013 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	43,411	38,540	4,871	943
Total costs for infants in first year of life	\$381,971,892	\$190,560,513	\$191,411,379	\$50,129,471
Average cost per child	\$8,799	\$4,944	\$39,296	\$56,965
Average length of stay (days)	3.8	2.2	16.6	26.8

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. In CY 2013 the average cost of care

¹ Includes all expenditures paid through 12/31/2014. Totals are subject to change based on updated data.

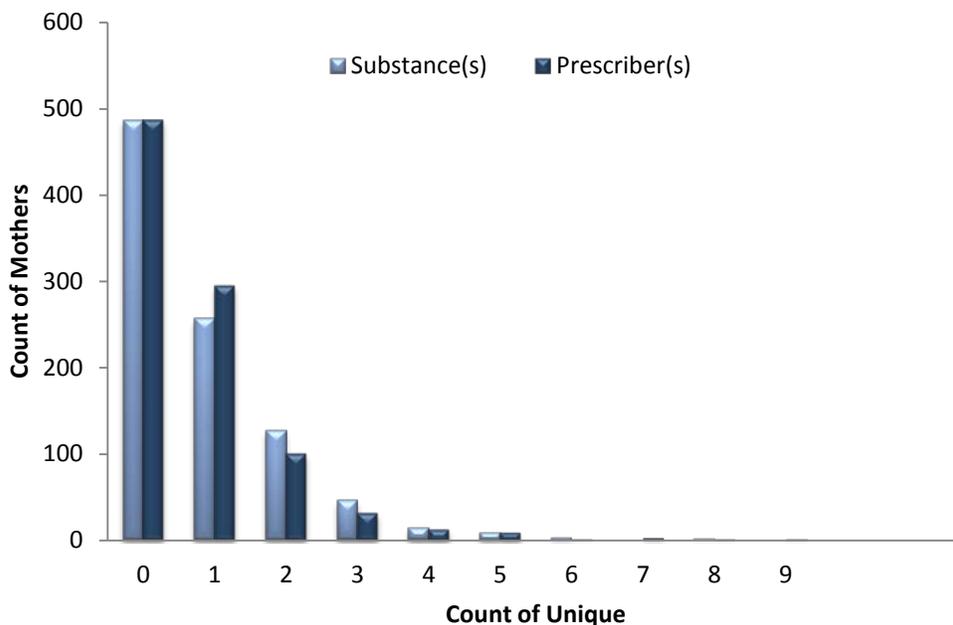
for a NAS infant in the first year of life is more than 12 times higher than the average cost of care for normal birth weight infants and approximately 1.4 times higher than the average cost of care for low birth weight infants.

Table 3: Percentage of newborns in DCS custody within one year of birth - 2013 data

Metric	All Infants	NAS infants
Total # of Infants	57,280	943
Total # infants in DCS	730	218
% in DCS	1.3%	23.1%

Using TennCare eligibility records it was determined that 218 of the 943 infants diagnosed with NAS in CY 2013 (23.1%) were placed in DCS custody within one year of their birth, a 5% decrease from CY 2012. Among all TennCare infants born in CY 2013, 1.3% were placed in DCS within one year of birth. Infants born with NAS are 18 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 – 2013 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 evaluated². The average number of claims per woman with a prescription was 1.7 a 26% decrease from the previous year. A total of 2,761 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 substances³ as well as the number of prescribers. On average, women had 1.6 unique prescribers⁴ of narcotics in the year period, with the max being 9 prescribers for one woman. Approximately 49% of women with NAS babies who received narcotics paid for by TennCare appeared to be receiving treatment for opioid dependence/addiction⁵; 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.

Table 4: Narcotic analgesic and contraceptive use among all TennCare women - 2013 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	290,422	37,413	129	5,676	15%	31,737	85%
15 - 20	81,438	1,536	19	636	41%	900	59%
21 - 24	43,069	3,098	72	926	30%	2,172	70%
25 - 29	52,501	7,331	140	1,559	21%	5,772	79%
30 - 34	48,304	9,540	198	1,458	15%	8,082	85%
35 - 39	37,457	8,696	232	725	8%	7,971	92%
40 - 44	27,654	7,212	261	372	5%	6,840	95%

Lastly, the rate of women using prescribed narcotic analgesics and contraceptive medications was determined in CY 2013. 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 products⁶. Women were excluded from the analysis if they had narcotic prescriptions totaling less than 30 days in CY 2013.

² Any pharmacy claim with an NDC correlation to GPI '65' was considered a prescription narcotic.

³ "Substances" were determined based on the first 9 digits of the NDC code

⁴ Determined based on unique NPI numbers of the prescribing doctor

⁵ Includes Buprenorphine formulations.

⁶ Any pharmacy claim with an NDC correlating to GPI2 '25' or GPI4 '9740' was considered a contraceptive.

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 129 users per 1,000 eligible women. The data above indicates that approximately 31,737 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. Women ages 15-24 are the most likely to have contraceptive and narcotic prescriptions (34%) when compared with other age ranges.