Kentucky Department for Public Health
Division of Maternal and Child Health

Data Brief

December 2015

Neonatal Abstinence Syndrome

In Kentucky

Annual Report

From the Public Health
Neonatal Abstinence Syndrome Reporting Registry

Kentucky Department for Public Health
Division of Maternal and Child Health
December, 2015

Kentucky Public Health
Prevent. Promote. Protect.

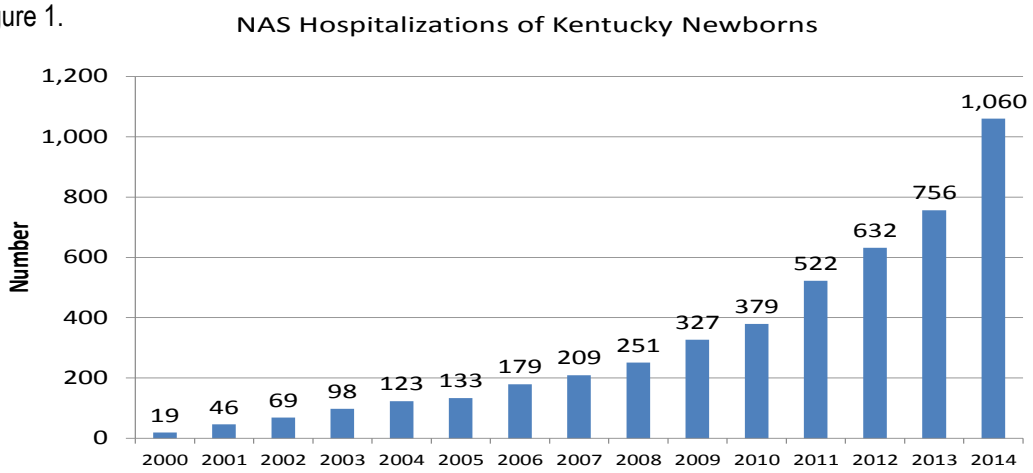
Neonatal Abstinence Syndrome in Kentucky

Annual Report from the Public Health Neonatal Abstinence Syndrome Reporting Registry Established in KRS 211.676

Substance abuse has reached epidemic levels in Kentucky and across the nation. In the recent Title V needs assessment in communities across the state, substance abuse was the top concern over all other health issues. Kentucky has experienced a tremendous increase in opiate use over the past decade with significant consequences. Among the general population in Kentucky, the prescribing rate of opioid pain relievers per 100 persons was 128.4 compared to 82.5 in the U.S. in 2012 (Paulozzi, Mack, & Hockenberry, 2014). Kentucky has also experienced an explosion in overdose deaths over the past decade. In 2013, Kentucky had the second highest age-adjusted drug overdose death rate in the nation at 23.7 deaths per 100,000 population compared to 13.8 per 100,000 in the U.S. (Slavova, 2015).

Pharmaceutical opioids are driving this epidemic, and pregnant women and their children have been significantly impacted. There are negative consequences of drug use for pregnant women including increased risks of assault and abuse, miscarriage, and contracting hepatitis or human immunodeficiency (HIV) (Wilder, Lewis, & Winhusen, 2015). Each year thousands of infants are exposed to substances while in the womb. While we know that alcohol and nicotine do more known damage to the fetus than all other substances, the baby who is chronically exposed to opioids and other drugs will often experience withdrawal after birth, called Neonatal Abstinence Syndrome (NAS). The rates of opioid abuse during pregnancy have increased nationally and in Kentucky. Tolia et al report an almost four-fold increase in admissions to neonatal intensive care units (NICUs) for NAS from 7 cases per 1000 NICU admissions in 2004 to 27 cases per 1000 admissions in 2012 (Tolia et al., 2015). In Kentucky, data from hospital discharge records indicate the number of newborns with NAS has increased 23-fold in the last decade (46 in 2001 vs. 1060 in 2014; Figure 1). Nationally and in Kentucky, about 80% of these infants are covered by Medicaid.

Figure 1.



Produced by the Kentucky Injury Prevention and Research Center, December 2015.
Kentucky Inpatient Hospitalization Claims Files, Frankfort, KY, [2000-2015];
Cabinet for Health and Family Services, Office of Health Policy.
Data for 2010-2015 are provisional; therefore these results are subject to change.

NAS Case Definition: Any mention of ICD9CM diagnosis code 779.5 AND any mention of ICD9CM diagnosis code V3x AND Kentucky resident AND patient's year of birth matches the reporting year

In order to better understand and combat this growing epidemic of substance abuse, the Kentucky General Assembly has enacted several laws. Specifically for NAS, one step was to collect better data by making NAS a public health reportable disease/condition to understand the extent of the problem. Kentucky Revised Statute (KRS) 211.676 requires the reporting of NAS cases to the Department for Public Health. KRS 211.678 calls for an annual report of de-identified, aggregate statistical data from this reporting. This data summary reports relevant findings from the first full 12 months of data collection of NAS as a reportable public health condition.

> KRS 211.676: All cases of neonatal abstinence syndrome (NAS) diagnosed among Kentucky resident births shall be reported to the Kentucky Department for Public Health by the facility where NAS is diagnosed. The report shall be made at the time of NAS diagnosis pursuant to guidance issued by the department.

Neonatal Abstinence Syndrome

Neonatal Abstinence Syndrome is the collection of symptoms babies experience in withdrawing from drugs they were chronically exposed to in utero. When the umbilical cord is cut at delivery, these substances no longer circulate to the baby, and the baby's physiology has to re-adjust to a drug-free environment. NAS is a clinical diagnosis based on signs and symptoms that are not unlike withdrawal in adults. It was classically described as withdrawal from opioid medications taken by the mother and was first documented in 1875. Morphine treatment for neonates began as early as 1903. However, symptoms of withdrawal can be seen with many drugs other than opiates and narcotics, including medications that are taken correctly and by a physician's prescription. [Table 1] NAS is managed the same way whether from opiates or from other drugs.

Babies experiencing withdrawal have irritability expressed as high-pitched cry, restlessness, hyperactive reflexes, myoclonic jerks, jitteriness, tremors, seizure; gastrointestinal disturbances including poor feeding, vomiting, loose stools; and other symptoms including fever, sweating, mottling, nasal flaring, apnea, and tachypnea. The severity of symptoms is typically assessed by the Finnegan Scoring method, a scale assigning a numerical score for each of the symptoms. Babies are first treated with non-pharmacologic comfort measure like holding, rocking, low lights, and minimal disturbances. When Finnegan scores rise and symptoms prevent the babies from sleeping, eating, and gaining weight, they may be put on medications. Over time, these medications are then tapered down slowly.

Case Definition for reporting: Kentucky Birthing Hospitals are instructed to report any infant with history or suspicion of perinatal substance exposure that exhibits the signs and symptoms that are consistent with NAS.

Cases for the NAS Public Health Reporting are not tied to a specific International Classification of Diseases (ICD) ICD-9 or ICD-10 code because it was discovered early in the reporting process that many physicians and facilities have been reluctant to use the NAS-specific code unless the infant requires medications to treat these symptoms. Infants who respond to non-pharmacologic treatment and who do not require medications are still experiencing withdrawal and are to be reported. There is a wide range in the literature, but overall about 50-60% of substance-exposed infants will go through withdrawal. There is misinformation in the field that if the mother is on buprenorphine the baby will not have withdrawal, but this is false. Neonatal abstinence syndrome incidence rates in infants born to mothers treated with methadone range from 45-65% and with buprenorphine from 22-63%. (Wiegand et al., 2015). Severity of NAS symptoms does not correlate with a mother's dose of opioid.

Table 1. Non-narcotic drugs that cause neonatal psychomotor behavior consistent with withdrawal.
Source: Hudak et al. Neonatal Drug Withdrawal. *Pediatrics 2012, 129(2):e542*

Drug	Signs	Onset of Signs	Duration of Signs[a]	Ref. No.
Alcohol	Hyperactivity, crying, irritability, poor suck, tremors, seizures; onset of signs at birth, poor sleeping pattern, hyperphagia, diaphoresis	3–12 h	18 mo	14,15
Barbiturates	Irritability, severe tremors, hyperacusis, excessive crying, vasomotor instability, diarrhea, restlessness, increased tone, hyperphagia, vomiting, disturbed sleep; onset first 24 h of life or as late as 10–14 d of age	1–14 d	4-6 mo with prescription	12,13
Caffeine	Jitteriness, vomiting, bradycardia, tachypnea	At birth	1-7 d	161
Chlordiazepoxide	Irritability, tremors; signs may start at 21 d	Days–weeks	9 mo; 11/2 mo with prescription	11
Clomipramine	Hypothermia, cyanosis, tremors; onset 12 h of age		4 d with prescription	162
Diazepam	Hypotonia, poor suck, hypothermia, apnea, hypertonia, hyperreflexia, tremors, vomiting, hyperactivity, tachypnea (mother receiving multiple drug therapy)	Hours–weeks	8 mo; 10–66 d with prescription	10
Ethchlorvynol	Lethargy, jitteriness, hyperphagia, irritability, poor suck, hypotonia (mother receiving multiple drug therapy)		Possibly 10 d with prescription	163
Glutethimide	Increased tone, tremors, opisthotonos, high-pitched cry, hyperactivity, irritability, colic		6 mo	164
Hydroxyzine	Tremors, irritability, hyperactivity, jitteriness, shrill cry, myoclonic jerks, hypotonia, increased respiratory and heart rates, feeding problems, clonic movements (mother receiving multiple drug therapy)		5 wk with prescription	58
Meprobamate	Irritability, tremors, poor sleep patterns, abdominal pain		9 mo; 3 mo with prescription	165
SSRIs	Crying, irritability, tremors, poor suck, feeding difficulty, hypertonia, tachypnea, sleep disturbance, hypoglycemia, seizures	Hours–days	1–4 wk	31–33,35

[a] Prescription indicates the infant was treated with pharmacologic agents, and the natural course of the signs may have been shortened.

Statistical Data

Number of Reported Cases: There were 1,649 reports to Public Health during the 12 month time period of August 1, 2014, to July 31, 2015, which represent 1,234 unduplicated cases. Infants who are born at one hospital and transferred to a higher level of care will have two reports, so these duplicate reports have been eliminated for analysis. That means, conservatively, there are 1,234 cases of symptomatic NAS in Kentucky resident births in the 12 months of reporting, or over 100 new cases of NAS in infants born each month in Kentucky. This is still an underestimate of the number of babies who may have NAS in Kentucky as it represents only 2% of Kentucky births, and nationally it is reported that 5.4% of pregnant women use illicit substances during pregnancy (Substance Abuse and Mental Health Services Administration, 2014). A prevalence study at University of Kentucky in 2005 estimated that 9% of births were substance-exposed (Bada H and Reynolds ER, 2009).

> For a 12 month period, there were 1,234 unduplicated cases of NAS reported to Public Health. This represents over 100 new cases of NAS each month in Kentucky.

Age at onset of symptoms: The onset of symptoms for NAS is variable but typically occurs 48-72 hours post-birth among infants with prenatal opioid exposure, although delayed onset of up to four weeks post-birth has been documented (Jones & Fielder, 2015). Kentucky's data shows a wide range for the onset of symptoms of withdrawal in newborns. The earliest onset was 30 minutes after birth and the latest reported was 168 hours (7 days) after birth, which is consistent with the time frames for onset reported in the literature. The average time for symptoms to appear from the Kentucky data was 26 hours of age. Onset of symptoms can be affected by the time of the

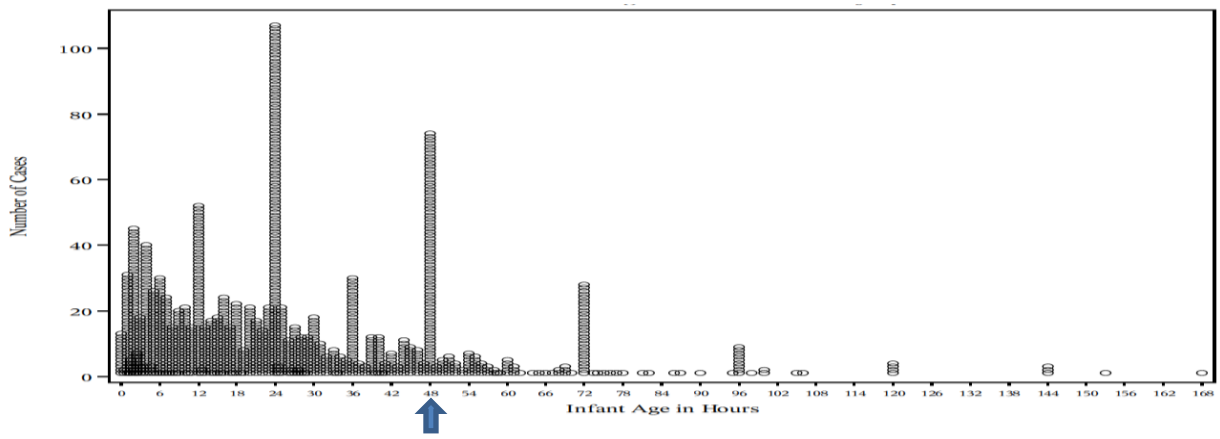
mother's last dose, the duration of the exposure, the total accumulation of the exposure, and if the neonate was exposed to more than one substance (Kocherlakota, 2014) [Table 2].

To evaluate risk of NAS for a substance-exposed infant, physicians treating the infant must be knowledgeable about the characteristics of the specific substances to which the infant was exposed. Both methadone and buprenorphine are long acting drugs and may take a long time to be eliminated from the baby's body, resulting in delayed onset of symptoms. Clinically, this is important because these exposed infants should not be discharged at the normal 48 hours of life simply because they have no symptoms. The American Academy of Pediatrics (Hudak & Tan, 2012) and the World Health Organization guidelines (2014) recommend infants with known fetal exposure to these drugs be observed in the hospital a minimum of 4-7 days to be sure they do not return home and experience withdrawal there. Withdrawal at home is not only frustrating for the family, but could be dangerous for the baby as dehydration from poor feeding, vomiting, or diarrhea can occur in just a few hours, and neurologic irritability can result in seizures. Families who seek medical attention for the baby after discharge may not bring up a history of substance use during the pregnancy, and the symptoms may not be recognized as NAS. Reported cases validate the recommendation to observe these infants in the hospital for 4-7 days, even if there are no symptoms of NAS. Of those cases reported to Public Health, 19% (one in 5) had onset of symptoms after 48 hours as indicated in Figure 2.

Table 2. Onset, Duration, and Frequency of NAS caused by various substances. Source: Kocherlakota. Neonatal Abstinence Syndrome. *Pediatrics 2014; 134:3552*. Note that methadone, buprenorphine, and other opioids may not have onset of symptoms until after 48 hours of age.

Drug	Onset, h	Frequency, %	Duration, d
Opioids			
Heroin	24–48	40–80[27]	8–10
Methadone	48–72	13–94[37]	Up to 30 or more
Buprenorphine	36–60	22–67[46,48]	Up to 28 or more
Prescription opioid medications	36–72	5–20[56,60]	10–30
Nonopioids			
SSRIs	24–48	20–30[64]	2–6
TCAs	24–48	20–50[64]	2–6
Methamphetamines	24	2–49[101]	7–10
Inhalants	24–48	48[70]	2–7

Figure 2. Infant Age at Onset of NAS Symptoms. Source: Kentucky Neonatal Abstinence Reporting Registry, 2015.
In 19% of reported cases, the onset of symptoms was beyond the 48 hour stay (indicated by the arrow) for a normal newborn.



Substances associated with NAS: In the Kentucky reporting data, the most reliable source for identifying substances used during pregnancy comes from maternal history. Of the 1,234 NAS babies reported, 91% had positive maternal history for substance use, while 69% of the mothers had a positive drug test, and 72% of the babies had a positive drug test. This is consistent with the many issues around positive drug screens and the lack of reliability of point in time testing, timing of the test related to drug metabolism, and other reasons for false positive and false negative tests.

Of the mothers of NAS babies, 68% were reported to have prescriptions for the drug used. Close to half (49.8%) of the mothers were prescribed a medication as treatment for addiction, 14.1% were on a supervised pain therapy program, and 4.9% had prescriptions to treat a psychiatric or neurological condition prior to delivery. Prescribing practices have clearly played a significant role in the rise of prescription opioid use and abuse. Most pregnant women using/abusing substances were doing so before they became pregnant (Jones, 2015). The rising incidence of NAS is a consequence of the prescription drug abuse epidemic overall.

The most common substance used by the mothers in the reported NAS cases was buprenorphine, the active drug in Subutex and Suboxone. Over 50% of the mothers reported using buprenorphine by history, and 25% of mothers tested positive for buprenorphine [Table 3]. Of the women with a positive history or test for buprenorphine, one-third reported it as the only drug they were taking, which may reflect successful treatment and control of addiction. The goal of medication assisted treatment (MAT) for addiction would be to have the person stabilized and taking only one drug. However, many of these women have co-occurring disorders such as depression or anxiety that require medications for treatment, so those using more than one medication may be in compliance with treatment by their health care providers. Additionally, with such widespread use of buprenorphine, there are concerns that pregnant women are accessing prescriptions for buprenorphine without the required "treatment" component (medical supervision, counseling, and support services) of MAT; new regulations from the Kentucky Board of Medical Licensure with requirements for buprenorphine prescribers should help address this issue.

Table 3. Most common substances of exposure for NAS infants identified in NAS Reporting.
Source: Kentucky Neonatal Abstinence Reporting Registry, 2015.

Identification of Most Common Substances of Exposure for NAS Infants*							
Positive by Maternal History (past or current use this pregnancy)	%		**Positive by Maternal Drug Test**	%		**Positive Drug Test on Infant**	%
Buprenorphine	50.7		Buprenorphine	25.4		Other Opiates	27.6
Other Opiates	33.2		Other Opiates	21.1		Buprenorphine	26.1
Oxycodone	22.9		Cannabinoid	13.1		Benzodiazepines	12.2
Cannabinoid	20.0		Oxycodone	10.7		Cannabinoid	11.5
Heroin	18.1		Benzodiazepines	7.9		Oxycodone	10.0
Benzodiazepines	14.2		Heroin	5.9		Heroin	5.7

*Note: Data reflects unduplicated, symptomatic, KY residents only

Another drug that is emerging in our reporting as a cause of NAS is gabapentin (Neurontin), a neurologic drug used in the treatment of seizures and nerve pain. Neonatologists in Kentucky have noticed this and report that infants exposed to gabapentin in utero can go through a severe withdrawal that is difficult to treat. Only one published study describes gabapentin and NAS (Carrasco, Rao, Bearer, & Sundararajan, 2015), so there is much to learn about managing this drug as a cause of NAS in the future.

Geographic Distribution: There are known geographic patterns of prescription drug abuse. Kentucky has been at the epicenter of the epidemic since the rise of oxycontin use two decades ago. Similarly, the geographic distribution of NAS also shows Kentucky to have one of the highest incidence rates in the country (Patrick, Davis, Lehmann, & Cooper, 2015)[Figure 3]. From the Public Health reporting of NAS, the geographic distribution of NAS within the state shows the incidence of NAS is heavily weighted toward the Appalachian counties and urban centers [Figure 4].

Figure 3. Geographic Distribution of Neonatal Abstinence Syndrome in the US. Source: Patrick SW, Davis MM, Lehmann CU, Cooper WO. Increasing Incidence and Geographic Distribution of Neonatal Abstinence Syndrome: United States 2009-2012. *JPerinatol 2015. 35(8): 650-655.*

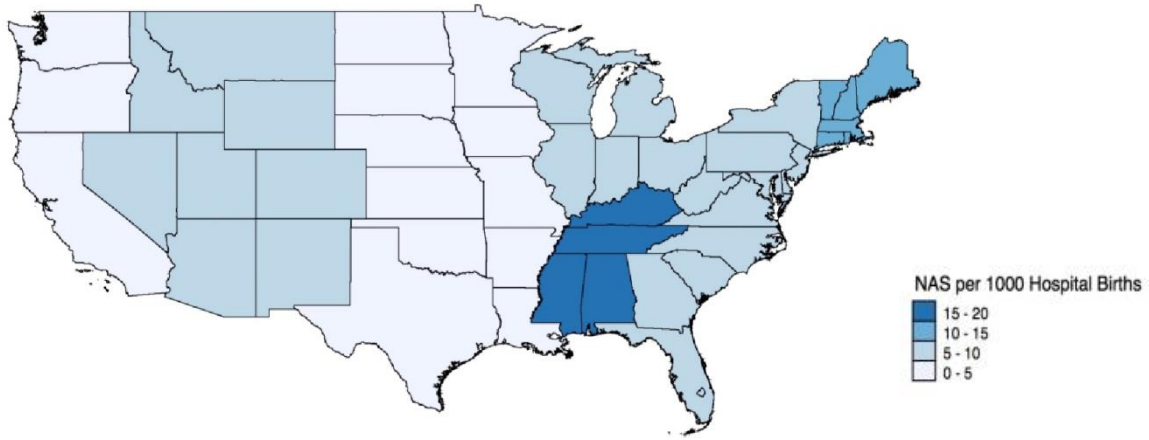
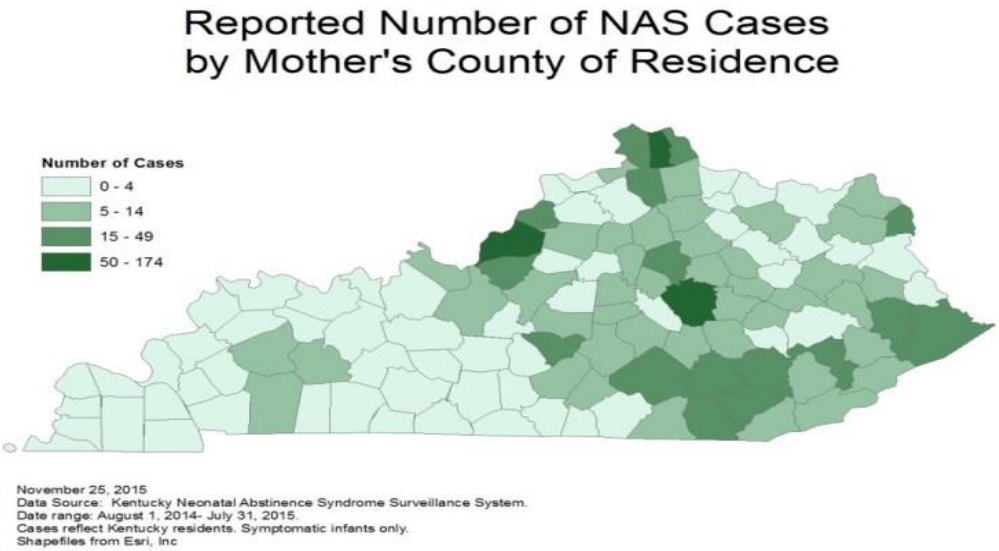


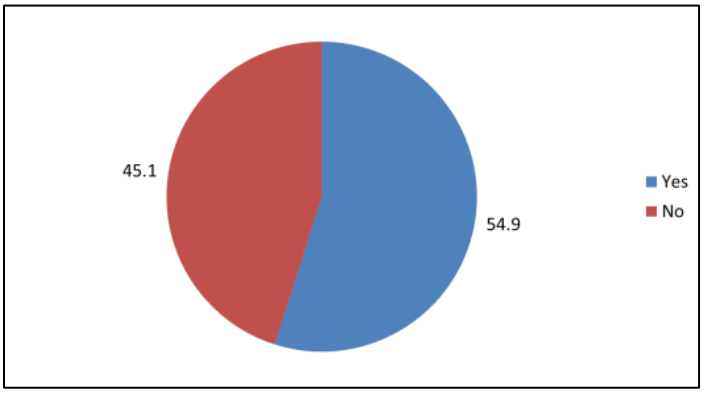
Figure 4. Geographic Distribution of NAS in Kentucky by number of reported cases.
Source: Kentucky Neonatal Abstinence Reportable Disease Registry, 2015.



Treatment of NAS: Despite the activity around NAS nationwide, there remains no standard "evidence-based treatment" for NAS. Generally, infants who are at risk for neonatal abstinence are monitored from birth using the Finnegan scoring tool every 2-4 hours. Non-pharmacologic treatments such as dim lighting, swaddling, small frequent feedings with a high calorie formula, and monitoring of weight loss/gain are typically implemented from birth. If these measures fail to control the symptoms, and symptoms become so intense they prevent the infant from eating, sleeping, and gaining weight -- all necessary for normal development -- then medications are begun. Among infants prenatally exposed to opioids, 21% to 94% will develop symptoms of NAS significant enough to require treatment (Sutter, Leeman, & Hsi, 2014). The factors that determine which infants will develop symptoms and which infants have more severe symptoms are not well understood and likely depend on the substances used as well as genetic, epigenetic, and environmental factors (Sutter, et al., 2014).

In the Kentucky reporting data, 54% of the babies with NAS symptoms reached scoring levels that required pharmacologic treatment [Figure 5]. The most common drug used to treat NAS is morphine, but methadone, phenobarbital, and clonidine are also used. The goal of treatment is to control the symptoms so that the baby is able to have developmentally-appropriate sleep and adequate intake to support nutrition. Once the baby's symptoms are controlled, the medications are slowly tapered over several days until they can be discontinued. Average length of stay for NAS is shorter in hospitals that use a standardized protocol for identification, management, and tapering medications regardless of medication chosen for treatment (Hall et al., 2014).

Figure 5. Percent of Reported NAS Cases that were Treated with Medications.
Source: Kentucky Neonatal Abstinence Reporting Registry, 2015.



Not all NAS infants have to be treated in Neonatal Intensive Care Units (NICUs). Even if treated with a medication, morphine is generally administered orally and IV's are not typically required. In fact, "rooming in" which means allowing the baby to stay in the same room with the mother has been shown to reduce the length of stay for NAS by up to 50%, even if the infant requires medications to treat NAS (Abrahams et al., 2007; Jansson & Velez, 2012). Rooming in also provides the mother the opportunity to learn and practice skills for feeding, calming, and caring for the infant, which will improve the likelihood of safe and successful transition to home care. When mothers are participating in a comprehensive treatment program that includes substance abuse treatment and supports such as housing, transportation, counseling, parenting training and coaching, discharge can be accomplished on average in 5-6 days (Wiegand, et al., 2015).

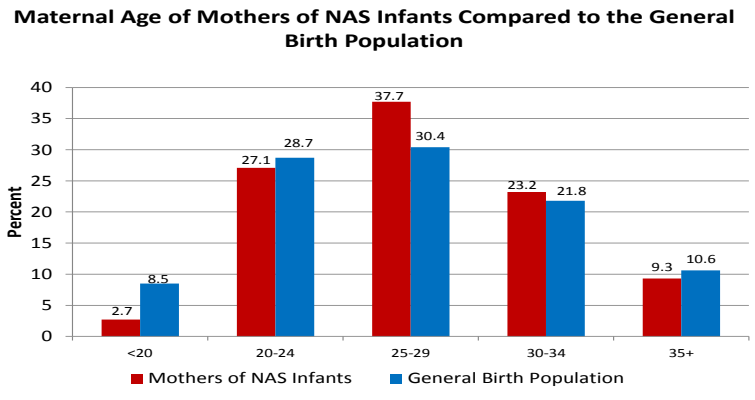
There are several known factors that make NAS more difficult to treat. Infants exposed to more than one substance (poly-substance use) are more difficult to treat than those exposed to only one substance. Most NAS babies have been exposed to poly-substance use. Several studies have shown that NAS is more difficult to treat if mother smoked or used benzodiazepines (anxiety medications) or SSRI's (antidepressants). Both depression and anxiety are common in this population. In Kentucky, 80% of mothers of NAS infants reported smoking compared to 19% of pregnant women in the overall birth population. Studies have shown use of nicotine by the pregnant women to be associated with the need for medication to treat NAS (Kaltenbach et al., 2012), greater dose of medication needed to treat NAS (Jones et al., 2013; Kaltenbach, et al., 2012), increased number of days treated with medication (Jones, et al., 2013), and prolonged length of hospital stay (Jones, et al., 2013).

Maternal and Infant Characteristics

By linking the NAS reporting information to vital statistics data, aggregate differences between mothers of NAS babies and mothers in the general birth population can be studied. Over 96% of the Kentucky mothers of reported NAS babies are non-Hispanic White. Notably, in the Kentucky reporting data, there are very few teen mothers of NAS babies (2.7% of mothers of NAS babies are teens compared to 8.5% of mothers in the general birth population). Over 90% of mothers of NAS babies are between the ages of 20 and 34 [Figure 6]. This is also consistent with the fact that ongoing substance use in women is often driven by a long history of traumatic experiences, such as domestic violence, abuse, or a partner using drugs. Without treatment for these traumas, the continued abuse of substances as a means of coping remains and is an obstacle to successful recovery.

Perhaps because these are older mothers, the majority (80%) of NAS births were to mothers who already had other children. Notably, it is also reported that over 90% of pregnancies in women with substance use disorder are unintended. As many as 50% of the cases of NAS are repeat cases (Warren, 2013) in which the mother has had another baby with NAS. Given that most pregnancies in women with substance use disorder are unintended, all women chronically on opioid therapy and all women who have given birth to a baby with NAS should be counseled about options for long-acting, reversible contraception. Ideally this should happen before they are discharged from the hospital after giving birth. This could prevent a significant number of new cases of NAS.

Figure 6. Maternal age of Mothers with NAS infants vs. Mothers in the general birth population.
Source: Kentucky Neonatal Abstinence Reporting Registry, 2015.



*Note: NAS Infants Data reflects unduplicated, symptomatic, KY residents only
Data Source: KY NAS surveillance system reporting database; Aug. 1, 2014- July 31, 2015
Kentucky Vital Statistics Files, Live Birth Certificate Files, Years 2014-2015; 2014 & 2015 data are preliminary and numbers may change

Outcomes for Neonatal Abstinence Syndrome: Collecting better data on infants with NAS will result in a better ability to assess outcomes. This will include linking to vital statistics files to determine if the risk of infant death in the first year of life is increased compared to other births. In cases reviewed by the Child Fatality and Near Fatality External Review Panel, several infants who were diagnosed with symptoms of NAS at birth later became child fatality victims, either from unsafe sleep (such as bed-sharing, often with an impaired adult), or from pediatric abusive head trauma. Because NAS babies can still have irritability and feeding problems for months after discharge, they are likely to be at higher risk for these deaths.

However, parental substance use disorder does not necessarily result in child harm or neglect (American College of Obstetricians and Gynecologists Committee on Ethics, 2015). Much like the crack-cocaine babies of the 1970's, there are reasons to be concerned about in-utero drug exposure and NAS, though whether prenatal opioid exposure or postnatal opioid treatment has any long-term effects on the newborn brain is largely unknown (Kocherlakota, 2014). Long-term outcomes studies have been small and inconclusive. What is known is that extremes of family dysfunction, including substance abuse in the home, mental illness in a parent, domestic violence, separation from a parent, and a family member in jail, are all Adverse Childhood Experiences (ACEs) that have lifelong effects (Felitti et al., 1998). Thus, in the period after birth while the infant's brain is being hardwired, the home environment of the infant may be the most critical to long-term outcomes. It is also the period when the new mother has the least access to treatment and supports that could stabilize her life, which is even more stressful after the birth of a new baby. The symptoms seen at school age in NAS babies - inattention, speech delay, and behavior and learning problems - are the same things seen with toxic stress from an environment in which there are multiple Adverse Childhood Experiences. Interventions for NAS after discharge can mitigate the effects of toxic stress but must focus on the maternal-infant dyad, not just the child, and address the stressors in the environment.

The best way to assure optimal outcomes for NAS babies is to provide comprehensive treatment and supports for the mothers with substance use disorder. This will stabilize the home environment and promote the attachment and bonding that literally hardwires the baby's brain and establishes brain pathways for social-emotional and cognitive functioning. Although foster care is necessary in some cases to assure the infant's safety, foster care also puts at risk the opportunity for the stable nurturing relationship and attachment that is necessary for hardwiring the infant's brain. These infants often experience multiple placements and lack a constant, caring adult in their lives to establish the bonding necessary for healthy brain development. Nationally, about 60% of NAS babies go home with their natural mothers, so treatment and supports after discharge are critical. For those mothers in comprehensive treatment programs, the outcomes are good. One comprehensive program reports that of women who complete the program, 75% of families in the outpatient program had positive changes (e.g., closed child protective cases, children re-united) and 100% of families in which mothers completed residential treatment had positive changes (Jones, 2015). These programs provide substance abuse treatment and supports for up to 12 months with six months aftercare.

> "The complexity and challenging nature of the home atmosphere should never be underestimated in these situations. The importance of an optimal home environment for the global development of these children should be emphasized." Kocherlakota, 2014

Summary and Next Steps

Data from the NAS Public Health Reporting Registry provides valuable information on specific characteristics of NAS in Kentucky that can be used to compare Kentucky to the US, better monitor trends in Kentucky, and allow more targeted interventions to be developed to address this problem. Some of the current activities underway specifically to address issues of substance abuse in pregnancy and NAS include:

- The Department for Behavioral Health and the Department for Public Health, both in the Cabinet for Health and Family Services, have obtained a three year SAMHSA (Substance Abuse and Mental Health Services Administration) grant to develop and test a model for comprehensive treatment and supports for pregnant and parenting women (prenatal until the infant's second birthday) to provide the stability needed for mothers to successfully enter and maintain recovery, reduce NAS in mothers receiving treatment, and support mothers to maintain recovery for parenting and nurturing the infant during the critical period of hardwiring the brain.
- Kentucky was awarded an "In Depth Technical Assistance" grant from the National Center for Child Welfare and Substance Abuse, which supported a statewide Perinatal Substance Abuse training in July 2015 for over 300 Kentucky providers working in the substance abuse field. The training was given by Dr. Hendree Jones, a national and international expert and researcher on substance abuse treatment for pregnant and parenting women and their infants. Another training is planned for spring 2015.
- The Kentucky Perinatal Association has established a Perinatal Quality Collaborative project with 20 birthing hospitals to develop and test model protocols for treating NAS to improve care and reduce length of stay.
- The Kentucky Department for Medicaid Services is working with Managed Care Organizations to establish a path for un-bundling long-acting reversible contraceptives used in the inpatient setting so that providers can be paid for that service and not require women to come back as an outpatient to access this healthcare.
- The Department for Public Health has promoted and provided evidence-based practice materials for birthing hospitals, drug courts, treatment centers, and other agencies that serve families involved with substance abuse to educate those families on prevention of abusive head trauma and prevention of unsafe sleep.
- The Department for Community Based Services is developing models like the Johnson County Communities of Hope and increasing sites for the START (Sobriety Treatment and Recovery Teams) to offer treatment and supports to women with substance use disorder before and after the birth of their children, thereby decreasing the number of children removed from their families and increasing re-unification.
- Funding from SB 192 for neonatal abstinence has been awarded to four treatment centers that will work with pregnant and parenting women with substance use disorders to reduce the number of infants born with NAS and increase the number of mothers who are able to maintain custody with safe and healthy environments for infants after birth.
- The Kentucky Board of Medical Licensure has implemented new regulations to address prescribing practices around buprenorphine, including specific measures required when prescribing buprenorphine for pregnant women.

Future reports from the NAS Public Health Reporting Registry, in addition to providing statistical analysis of reported cases, will be used to enhance related information collected from other data sources, including the

Kentucky All Prescription Electronic Reporting (KASPER), the Perinatal Hepatitis B and C Disease Registry at the Kentucky Department for Public Health, and the Kentucky Injury Prevention Research Center at University of Kentucky, which studies overdose and emergency room data around substance use.

For more information or questions about this report, please contact the Public Health Neonatal Abstinence Reporting Registry Team by email at neonatalabstinence@ky.gov.

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