

The Neonatal Abstinence Syndrome Framework

Overview

The neonatal abstinence syndrome (NAS) framework is a revised version of the supplement to ASTHO's 2015 issue brief, [How State Health Departments Can Use the Spectrum of Prevention to Address Neonatal Abstinence Syndrome](#). The framework's intent is to aid in structuring stakeholder discussions at the state level to better understand how collective efforts can prevent in-utero opioid exposure and impact the incidence of NAS.

Multisector state, regional, and local partners can benefit from working together on this issue.

Suggested partners include:

- State health agencies, including the state health official, state epidemiologist, and maternal and child health, injury prevention, or behavioral health directors.
- Medicaid administrators.
- Behavioral health, mental health, substance use and addiction services.
- Child welfare and foster care agencies.
- Correctional and law enforcement personnel.
- Education departments, including early childhood (0-5) programs.
- State associations: OB/GYN, pediatrics, primary care, pharmacists, neonatal nurses, addiction specialists, acute and chronic care, hospitals.
- Legislators.
- Academia.
- Local advocacy groups.
- Local health agencies.
- Perinatal quality collaboratives.

ASTHO developed this case study to document one state's experience using the NAS framework with the goal of refining it as a tool for other jurisdictions to identify collective goals and gaps in current approaches to this complex issue (see Appendix A: Results from the NAS Framework Focus Group). A comparison between the original and revised framework is included in Appendix B. Focus group participants and acknowledgements are referenced in Appendix C.

Section 1: Using Data to Understand the Scope of the Problem

Various data sources provide insight into the scope of NAS and the prevalence of opioid misuse and addiction among women. These sources may include hospital-based billing and administrative codes (e.g., DRGs and ICD), prescription drug monitoring programs, child protective services data, and substance abuse treatment data. The state hospital association may be a key partner for data collaboration and review.

Stakeholder Discussion Questions:

- What data sources can be used to determine NAS incidence and opioid misuse among pregnant women in our state?
- What are the strengths and limitations of these data sources?
- How are these data currently being used?
- What opportunities exist for better coordinating data collection efforts (in a patient de-identified or identified manner) and disseminating findings?
- What outcome measures are most important to local efforts?
- What will improving rates look like?

Example actions:

- State health agencies can use surveillance to illustrate trends over time and deliver NAS-affected infants and the sources of maternal opiate use to deliver targeted services and resources to regions where NAS and maternal opioid use are most prevalent.
- Partner agencies, such as the state child protective services agency, can share data to establish a coordinated response to NAS.
- Hospitals and private and public insurers can share data with health agencies to better understand the issue.
- Community partners and local advocacy groups can use data to appeal to policymakers.

Section 2: Primary Prevention—Reducing the Occurrence of In-utero Opioid Exposure

Broad socioeconomic and life course factors can impact individual risk of opioid addiction and misuse. These factors, along with high rates of overprescribing among healthcare providers, can elevate community-level risk. Addressing poverty and intergenerational or social risk factors, providing access to substance misuse and addiction education, healthcare, and family planning services, and implementing clinical guidelines for prescribing opioids can mitigate the risk of in-utero opioid exposure.

Stakeholder Discussion Questions:

- What system-level factors are we addressing in our state's approach to preventing opioid misuse and addiction and unintended pregnancies?
- What risk factors are we not currently addressing?
- Are we starting early enough to identify at-risk youth, women, and families?
- How do providers in our state approach initiating and evaluating opioid treatment for patients? Is pregnancy intention part of the dialogue with patients when prescribing opioids?

Example actions:

- State health agencies can promote awareness of the effects of prenatal substance use by educating adolescents and adult women about the risks of unhealthy use.
- Providers can encourage no substance use (including of tobacco and alcohol) when planning pregnancy and during pregnancy.
- Providers can develop guidelines for and provide universal screening, brief intervention and referral to treatment during routine medical visits for all women of childbearing age.

Section 3: Secondary Prevention—Treating Known In-utero Opioid Exposure to Reduce the Severity of Consequences

There is no consensus around the best way to diagnose and treat opioid addiction in women and infants. Public health and healthcare professionals should continue to identify systems and practice approaches to effectively identify, treat, and follow up with women with substance use disorders and their infants.

Stakeholder Discussion Questions:

- Consider each of the time periods around in-utero opioid exposure and some cross-cutting themes, as shown in the table below: What is being done for opioid addiction and NAS?

	Diagnosis	Management	Degree of Care Coordination	Culture of Care
Preconception				
Prenatal				
Postpartum/newborn				

- What is being done in our state to advance the knowledge base on best practices for diagnosis, management, and care coordination?
- What do we know about the variability in approaches to caring for women and infants in different settings or communities statewide? How can we move the spectrum of care to reduce variability and improve outcomes?
- What is the culture of caring for women with opioid addiction? What barriers to accessing care does this create, if any?

Example actions:

- State health agencies can develop better measures to ensure follow-up with opioid-dependent women and receipt of comprehensive services.
- Medicaid agencies and insurers can provide reimbursement for utilizing screening protocols to detect substance misuse and addiction early in pregnancy and withdrawal signs in infants.
- Medicaid agencies and insurers can provide funding for enhanced prenatal services, including referrals to services coordinated with other relevant entities prior to birth (e.g., hospitals, substance abuse treatment providers, etc.).
- Providers can universally screen pregnant women for substance use and make referrals to treatment when appropriate.
- Provider groups and hospitals can collaborate to strengthen clinical standards for identification and management with women with substance exposed pregnancies or NAS-affected infants.

Section 4: Tertiary Prevention—Ensuring Positive Long-term Health Outcomes for Children with In-utero Opioid Exposure and Their Families

Stakeholder Discussion Questions:

Long-term follow-up and support for women and children affected by in-utero opioid exposure will ideally involve a coordinated, multidisciplinary, and family-centered approach.

- What would wrap-around recovery services and relapse prevention ideally look like?
- How does our state support the recovery of parents and children through the work of:
 - Healthcare providers.
 - Mental health and behavioral health providers.
 - Family and reproductive planning services.
 - Child welfare services.
 - Child care, employment, and educational services.
 - Criminal justice reform.
- Are there some services that are not available in our communities?
- Are services accessible and appropriate? Are there opportunities for peer support and group care?
- Are services available for at least the first 18 months of a child's life?

Example actions:

- State health agencies can develop better measures to ensure long-term follow-up is coordinated, family centered, and comprehensive.
- Providers and hospitals can make referrals for developmental or child welfare services.
- Provider groups and hospitals can collaborate to strengthen clinical standards for follow-up with women with substance exposed pregnancies, NAS-affected infants, and their families.
- Medicaid agencies and private insurers can provide funding for developmental services.
- Child welfare services and law enforcement personnel can ensure a home environment safe from abuse and neglect by assessing safety and developing a plan of safe care.
- State health and education departments can work together to provide appropriate education, screening, and support as children with in-utero substance exposure approach adolescence to prevent adoption of risk behaviors that may lead to substance misuse and addiction.

Appendix A: Results from the NAS Framework Focus Group

Introduction

The neonatal abstinence syndrome (NAS) framework is a revised version of the supplement to ASTHO's 2015 issue brief, [How State Health Departments Can Use the Spectrum of Prevention to Address Neonatal Abstinence Syndrome](#). The framework's intent is to aid in structuring stakeholder discussions at the state level to better understand how collective efforts can prevent in-utero opioid exposure and impact the incidence of NAS.

ASTHO developed this case study to document one state's experience using the NAS framework with the goal of refining it as a tool for other jurisdictions to identify collective goals and gaps in current approaches to this complex issue.

ASTHO invited representatives from Ohio to review the NAS framework based on the state's long-standing and multifaceted work on NAS. ASTHO conducted interviews with the Ohio stakeholders to obtain their feedback on the utility of the NAS framework and applicability to their efforts. The interviewees provided ideas to make the framework more accessible by defining the stages of prevention, discussing the broader life course perspective and socioeconomic factors in the context of primary prevention, reorganizing the secondary prevention section to flow chronologically, and expanding the tertiary prevention section. Ohio interviewees' comments are summarized in this report and form the basis of the proposed revisions to the NAS framework.

Methods

ASTHO staff reviewed a short list of potential states for this case study and made initial contact with one or more key stakeholders in each state. Based on the initial contact's response and interest in participating in the case study, ASTHO staff selected Ohio as the state for vetting the NAS framework and invited stakeholders from various organizations and disciplines in Ohio working on NAS to participate in a group interview. ASTHO held two group conference calls on July 14 and Aug. 9, 2016 to obtain feedback from Ohio informants on the NAS framework using the following questions to guide the groups' discussions:

- Is the NAS framework asking the right questions?
- Is the format and structure of each section in the framework logical and easy to use?
- What assumptions are being made? Are they valid?
- How do you think the framework's questions will be received by different stakeholders in your state?
- How could the framework be made more relevant and engaging to inform your work?
- How would you use this framework?

Eight Ohio participants provided feedback, representing the following disciplines or agencies: neonatology, maternal and child health, the Ohio Department of Health, the Ohio Department of Medicaid, and the Ohio Department of Mental Health and Addiction Services. [Appendix C] The first group call was a webinar and the second call was a teleconference. Participants on the first call were shown a slide presentation to give them background on the NAS framework, orient them to the purpose of the case study, and present the guiding questions for discussion.

Findings

Ohio participants provided overall feedback on the structure and format of the NAS framework. They recommended each section of the framework—data, primary prevention, secondary prevention, and tertiary prevention—begin with an introduction on the scope of the section and a summary of the current knowledge base, followed by a list of questions to generate discussion. The framework is based on the stages of prevention, which the participants indicated would likely be familiar concept to public health stakeholders and clinical professionals, for example, but might require additional explanation for professionals from other disciplines, such as law enforcement or child welfare. To make the framework widely accessible to all stakeholders, it may be helpful to add a brief definition next to each stage of prevention. Also, the terms “primary,” “secondary” and “tertiary” prevention are relative to the outcome of focus. For example, with respect to NAS, some relevant outcomes may be:

- Preventing opioid misuse and addiction among all women of reproductive age.
- Preventing opioid misuse and addiction among pregnant women.
- Preventing in-utero opioid exposure.
- Preventing a baby being born physiologically addicted to an opioid.
- Suggest a tertiary prevention example, like “Preventing long-term adverse health outcomes/developmental delays in babies born addicted to an opioid.”

The NAS issue brief refers to the goal of reducing the incidence of in-utero opioid exposure. Clearly stating this defined outcome—to which the framework’s prevention terms apply—may be addressed by revising the introductory section to read:

“SUPPLEMENTAL MATERIAL: NAS FRAMEWORK

This is a suggested framework for structuring key stakeholder discussions and understanding how these efforts work collectively towards the ultimate goal of preventing in-utero opioid exposure.”

See Appendix B to view the proposed revisions next to the original version of the framework.

Section 1: Use Data to Understand the Scope of the Problem

Ohio participants listed various sources of data that they use to track the scope of NAS. These data sources include diagnostic related groups (DRGs) and International Classification of Disease (ICD) codes. Participants noted that there are variability and inconsistencies in this data as it is based on coding practices at the hospital level. Also, DRGs are not exclusive to opioids and include other drugs of addiction that may cause clinical symptoms in newborns. Data from the Ohio Hospital Association (OHA) is a key source of Ohio’s tracking NAS incidence and costs. NAS is a reportable diagnosis, and OHA collects and summarizes the data on the number of hospitalizations for NAS and health complications among babies born with a diagnosis of NAS. The key role of the hospital association was brought up by participants on both calls, and this collaboration should be mentioned in the NAS framework. As one participant explained, health departments need to form relationships with their state hospital association for collaborative analyses of NAS data.

Other key data sources are also not referenced currently in the NAS framework and may quantify the larger scope of the opioid addiction issue. These data sources include the prescription drug monitoring program (PDMP), the Treatment Episode Data Set (TEDS) from the Substance Abuse and Mental Health Services Administration (SAMHSA), and any other source data for prevalence of opioid misuse and

addictions among women of reproductive age. Some discussion of PDMPs on both Ohio calls underscored this as an important data source for the prescription drug part of the opioid misuse and addictions issue. Sharing data from the PDMP can be a powerful tool for provider education and behavior change. One participant from Ohio commented that sharing the PDMP data with healthcare providers resulted in a reduction in opioid prescriptions in the Medicaid population.

The comments from Ohio also highlighted the importance of the question currently included in the NAS framework: What opportunities exist for coordinating data collection efforts (in patient de-identified or identified manner)? Based on the Ohio feedback, this particular question should be moved up and made a major bullet in the data section.

A proposed revision of the data section in the NAS framework reads as follows:

“Section 1: Using Data to Understand the Scope of the Problem

Various data sources provide insight into the scope of NAS and the prevalence of opioid misuse and addiction among women. These sources may include hospital-based billing and administrative codes (e.g., DRGs and ICD), prescription drug monitoring programs, and substance abuse treatment data. The state hospital association may be a key partner for data collaboration and review.

- ***What data sources can be used to determine NAS incidence and opioid misuse among pregnant women in our state?***
- ***What are the strengths and limitations of these data sources?***
- ***How are these data currently being used?***
- ***What opportunities exist for better coordinating data collection efforts (in a patient de-identified or identified manner) and disseminating findings?***
- ***What outcome measures are most important to local efforts?***
- ***What will improving rates look like?”***

Section 2: Primary Prevention

Ohio participants expressed the importance of considering a broad, life course perspective and systems level view of primary prevention. Introducing this section by summarizing known risk factors for opioid misuse and referencing the life course perspective would be helpful. Then the framework can help stakeholders explore a state’s approach to known risk factors and identify what is missing.

With respect to preventing the occurrence of in-utero opioid exposure, primary prevention efforts focus on preventing the incidence of opioid misuse or addictions in the first place, and so efforts need to consider school-aged children and youth to really try to mitigate risk. Broad foundational issues, such as social and family protective factors and strong educational systems, can help youth avoid opioid use in the first place. There are familial and social factors that can identify young children at higher risk for drug misuse and addiction. For example, many children with parents who misuse or are addicted to drugs are at greater risk for a variety of poor health outcomes. A healthcare provider, teacher, or child welfare worker can begin identifying youth with rising risks during early childhood. This is a population that should be a particular focus for primary prevention.

Many Ohio informants felt that addressing primary prevention of opioid misuse in the immediate preconception period is too late. Taking a broader approach, bullet two in the current framework, which reads “what types of supports are in place to encourage communication and coordination between care

providers and patients,” may be too restrictive and more applicable to secondary prevention efforts. The key aspect of primary prevention that does focus more specifically on women of reproductive age is access to family planning and counseling, so that the timing of pregnancy is under women’s control, and this specific point may warrant mention in the primary prevention section.

From the healthcare perspective, opioid prescribing is a critical aspect of primary prevention. Provider education on prescribing patterns at the population level and clinical guidelines for managing opioid use at the individual patient level can help standardize healthcare providers’ approaches to safe, judicious prescribing. PDMPs are key to this effort to monitor population and individual prescriber trends. Ohio PDMP data, for example, shows that women are prescribed more opioids than men—in absolute numbers and per capita—and at higher doses. Education and feedback to providers that conveys such information may influence prescribing behavior.

Proposed revision of the framework’s primary prevention section may read:

“Section 2: Primary Prevention—Reducing the Occurrence of In-utero Opioid Exposure

Broad socioeconomic and life course factors can impact individual risk of opioid addiction and misuse. These factors, along with high rates of overprescribing among healthcare providers, can elevate community-level risk. Addressing poverty and intergenerational or social risk factors, providing access to substance misuse and addiction education, healthcare, and family planning services, and implementing clinical guidelines for prescribing opioids can mitigate the risk of in-utero opioid exposure.

- ***What system-level factors are we addressing in our state’s approach to preventing opioid misuse and addiction and unintended pregnancies?***
- ***What risk factors are we not currently addressing?***
- ***Are we starting early enough to identify at-risk youth, women, and families?***
- ***How do providers in our state approach initiating and evaluating opioid treatment for patients? Is pregnancy intention part of the dialogue with patients when prescribing opioids?”***

For the next iteration of the NAS framework, ASTHO may consider referencing the SAMSHA primary prevention plan for communities.

Section 3: Secondary Prevention

There is lack of consensus in the obstetric and pediatric fields on the best practices to treat known in-utero opioid exposure, and this can be the basis for a discussion of secondary prevention efforts. States can partner with the American Congress of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP) to aid in furthering the knowledge base to create guidelines for diagnosis and treatment of opioid addiction in women and infants. Currently, there is no consensus around what screening tools or treatment protocols are most effective for women or infants.

During the Ohio group calls, the NAS framework section on secondary prevention was met with some confusion. This section may benefit from being reorganized based on a chronological approach. For example, in each chronological period moving from preconception, prenatal to postpartum, there could be discussion of what is and is not known as the best way to diagnose and treat opioid misuse and

addiction and NAS. This may be aided by a simple, illustrative graphic or table to display the cross-cutting themes and the time periods for intervention:

	Diagnosis	Management	Degree of Care Coordination	Culture of Care
Preconception				
Prenatal				
Postpartum/Newborn				

Stakeholders could be asked to complete or consider this table when discussing secondary prevention efforts that are in place or are needed in their states.

Ohio participants expressed the importance of considering coordination of care and the culture of care when working with women with substance use disorders. A lead care coordinator should be identified early in the process of obtaining care. From a systems level, integration of primary care, prenatal and obstetric services, and mental health services is an important goal. As an example of care coordination, one Ohio participant described that, in his experience, engaging Medicaid managed care plans has been critical for short-term success and likely important to long-term success in caring for women with substance use disorders. Another participant commented on the need to change the culture for patients with addiction to move towards increased empathy. Reframing opioid addiction as a medical condition and not a criminal issue may be an important cultural shift that all stakeholders can work towards. Empathy can counter the stigma of seeking care that is a barrier for some women, particularly as they may have to seek different providers and systems to access necessary services. To emphasize the importance of empathetic care, Ohio uses the tagline, “nurture the mother, nurture the baby.”

Proposed revision of the NAS framework’s secondary prevention section may read:

“Section 3: Secondary Prevention—Treating Known In-utero Opioid Exposure to Reduce the Severity of Consequences

There is no consensus around the best way to diagnose and treat opioid addiction in women and infants. Public health and healthcare professionals should continue to identify systems and practice approaches to effectively identify, treat, and follow up with women with substance use disorders and their infants.

- ***Consider each of the time periods around in-utero opioid exposure and some cross-cutting themes, as shown in the table below: What is being done for opioid addiction and NAS?***

	Diagnosis	Management	Degree of Care Coordination	Culture of Care
Preconception				
Prenatal				
Postpartum/newborn				

- ***What is being done in our state to advance the knowledge base on best practices for diagnosis, management, and care coordination?***

- ***What do we know about the variability in approaches to caring for women and infants in different settings or communities statewide? How can we move the spectrum of care to reduce variability and improve outcomes?***
- ***What is the culture of caring for women with opioid addiction? What barriers to accessing care does this create, if any?"***

For the next iteration of the NAS framework, ASTHO may consider referencing the ACOG recommendations for opioid-exposed pregnancies that are in development.

Section 4: Tertiary Prevention

Ohio participants felt the tertiary prevention section of the framework needed to be expanded. Participants felt that the section should reference some of the diverse groups interacting with families in the first few years after a child is born and diagnosed with NAS. The framework may be a place to mention the desired cooperation between different sectors. Pediatric, family medicine, mental health, and reproductive service providers all are important in caring for children and their parents. Mental health is a salient need as women who have a history of substance use disorder are at risk for depression and relapse in the postpartum period. Supports need to be in place to get women to keep their appointments with healthcare, mental health, and behavioral health providers. In addition, families may be involved with social service systems, such as child welfare and the court system. Families also need opportunities to rebuild through educational and employment opportunities and child care support.

The setting for service provision is as important to consider as the type of services available. Community-based services may be more accessible. Peer support and group care may be better received as they form connections between at-risk women and women who have walked a similar path before.

Finally, the duration of services is important to reference in the framework. Ohio participants emphasized on both informant calls the need for long-term support, at least for the first 18 months of a child's life. Opioid use cannot be thought of as an acute problem; it is a chronic issue for the women and men affected, and as such, parents and their children need long-term follow-up and support.

Proposed revision of the tertiary prevention section of the framework may read:

"Section 4: Tertiary Prevention—Ensuring Positive Long-term Health Outcomes for Children with In-utero Opioid Exposure and Their Families

Long-term follow-up and support for women and children affected by in-utero opioid exposure will ideally involve a coordinated, multidisciplinary, and family-centered approach.

- ***What would wrap-around recovery services and relapse prevention ideally look like?***
- ***How does our state support the recovery of parents and children through the work of:***
 - ***Healthcare providers.***
 - ***Mental health and behavioral health providers.***
 - ***Family and reproductive planning services.***
 - ***Child welfare services.***
 - ***Child care, employment, and educational services.***
 - ***Criminal justice reform.***

- *Are there some services that are not available in our communities?*
- *Are services accessible and appropriate? Are there opportunities for peer support and group care?*
- *Are services available for at least the first 18 months of a child's life?"*

For the next iteration of the NAS framework, ASTHO may consider mentioning other programs, such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) program, which may be an entry point for families accessing care and getting needed support services.

Conclusion

The issue of NAS and opioid misuse and addiction in pregnancy is complex, necessitating multisector coordination and systematic support. States are taking steps to better identify, treat, and support women and children affected by in-utero substance exposure, but maintaining a continued focus on public health approaches to preventing NAS is critical for federal, state, and local partners. By improving the format and utility of the NAS framework, ASTHO hopes to support and strengthen state capacity to plan for the integration and optimal use of resources to achieve better and more equitable health outcomes. The ultimate goal is to prevent in-utero opioid exposures, and that is our shared vision in partnering with those working at the state and local levels.

Appendix B: Comparison Between the Original and Revised NAS Frameworks

Original Version	Proposed Revision
<p>Presented below is a suggested framework for structuring key stakeholder discussions and understanding how these efforts work collectively towards the goal of healthy outcomes.</p>	<p>This is a suggested framework for structuring key stakeholder discussions and understanding how these efforts work collectively towards the goal of preventing in-utero opioid exposure.</p>
<p>Use data to understand the scope of the problem.</p> <ul style="list-style-type: none"> • What is the data source for current NAS incidence rates in our state? <ul style="list-style-type: none"> ○ What are the strengths and limitations of this data source? • What state agencies and departments, healthcare providers, or community organizations currently collect information related to in-utero opioid exposure and NAS? <ul style="list-style-type: none"> ○ How is this data currently used? ○ What differences or similarities exist in data collection and interpretation efforts? ○ What opportunities exist for coordinating data collection efforts (in patient de-identified or identified manner)? • What standardized outcome measures exist? What outcome measures are important to local efforts? • What will improvement in rates look like? 	<p>Section 1: Using Data to Understand the Scope of the Problem</p> <p>Various data sources provide insight into the scope of NAS and the prevalence of opioid misuse and addiction among women. These sources may include hospital-based billing and administrative codes (e.g., DRGs and ICD), prescription drug monitoring programs, child protective services data, and substance abuse treatment data. The state hospital association may be a key partner for data collaboration and review.</p> <p>Stakeholder Discussion Questions:</p> <ul style="list-style-type: none"> • What data sources can be used to determine NAS incidence and opioid misuse among pregnant women in our state? • What are the strengths and limitations of these data sources? • How are these data currently being used? • What opportunities exist for better coordinating data collection efforts (in a patient de-identified or identified manner) and disseminating findings? • What outcome measures are most important to local efforts? • What will improving rates look like? <p>Example actions:</p> <ul style="list-style-type: none"> • State health agencies can use surveillance for NAS-affected infants and the sources of maternal opiate use. • Partner agencies, such as the state child protective services agency, can share data to establish a coordinated response to NAS.

	<ul style="list-style-type: none"> Hospitals and private and public insurers can share data with health agencies to better understand the issue.
<p>Consider primary prevention efforts.</p> <ul style="list-style-type: none"> What are non-biological factors (social conditions) that influence the course of addiction in your community? What types of supports are in place to encourage communication and coordination between care providers and patients? What types of programs are in place to prevent unintended pregnancies? 	<p>Section 2: Primary Prevention—Reducing the Occurrence of In-utero Opioid Exposure Broad socioeconomic and life course factors can impact individual risk of opioid addiction and misuse. These factors, along with high rates of overprescribing among healthcare providers, can elevate community-level risk. Addressing poverty and intergenerational or social risk factors, providing access to substance misuse and addiction education, healthcare, and family planning services, and implementing clinical guidelines for prescribing opioids can mitigate the risk of in-utero opioid exposure.</p> <p>Stakeholder Discussion Questions:</p> <ul style="list-style-type: none"> What system-level factors are we addressing in our state’s approach to preventing opioid misuse and addiction and unintended pregnancies? What risk factors are we not currently addressing? Are we starting early enough to identify at-risk youth, women, and families? How do providers in our state approach initiating and evaluating opioid treatment for patients? Is pregnancy intention part of the dialogue with patients when prescribing opioids? <p>Example actions:</p> <ul style="list-style-type: none"> State health agencies can promote awareness of the effects of prenatal substance use by educating adolescents and adult women about the risks of unhealthy use. Providers can encourage no substance use (including of tobacco and alcohol) when planning pregnancy and during pregnancy. Providers can develop guidelines for and provide universal screening, brief intervention and referral to treatment

	<p>during routine medical visits for all women of childbearing age.</p>
<p>Consider secondary prevention efforts.</p> <ul style="list-style-type: none"> • Do consistent screening and care management protocols exist? • Are there established systems of care that facilitate access to substance addiction treatment, prenatal, and newborn care? <p>Consider current best practices for managing the opioid-dependent mother and newborn dyad during the immediate post-partum period. When promoting implementation of these practices:</p> <ul style="list-style-type: none"> • Identify and assess educational programs and quality improvement initiatives that already exist and may be adapted for local use. • Be mindful of the depth of evidence-based research that informs these practices, acknowledge where evidence is limited, and identify opportunities for further investigation to continue to improve these practices. <p>Expand access to medication assisted treatment (MAT).</p> <ul style="list-style-type: none"> • To what extent do these programs provide wrap-around services (behavioral, counseling, and support) for opioid-dependent pregnant women? • How are pregnant women connected to these programs and services? <p>Identification and treatment of in-utero opioid exposures.</p> <ul style="list-style-type: none"> • Do screening, monitoring, NAS treatment, and discharge practices vary across the state? <ul style="list-style-type: none"> ○ If so, why? • What quality improvement and education efforts related to caring for opioid-exposed mothers and newborn dyads exist? 	<p>Section 3: Secondary Prevention—Treating Known In-utero Opioid Exposure to Reduce the Severity of Consequences</p> <p>There is no consensus around the best way to diagnose and treat opioid addiction in women and infants. Public health and healthcare professionals should continue to identify systems and practice approaches to effectively identify, treat, and follow up with women with substance use disorders and their infants.</p> <p>Stakeholder Discussion Questions:</p> <ul style="list-style-type: none"> • Consider each of the time periods around in-utero opioid exposure and some cross-cutting themes, as shown in the table below: What is being done for opioid addiction and NAS? • What is being done in our state to advance the knowledge base on best practices for diagnosis, management, and care coordination? • What do we know about the variability in approaches to caring for women and infants in different settings or communities statewide? How can we move the spectrum of care to reduce variability and improve outcomes? • What is the culture of caring for women with opioid addiction? What barriers to accessing care does this create, if any? <p>Example actions:</p> <ul style="list-style-type: none"> • State health agencies can develop better measures to ensure follow-up with opioid-dependent women and receipt of comprehensive services. • Medicaid agencies and insurers can provide reimbursement for utilizing screening protocols to detect substance misuse and addiction early in pregnancy and withdrawal signs in infants. • Medicaid agencies and insurers can provide funding for enhanced prenatal

<ul style="list-style-type: none"> ○ Are these efforts coordinated locally, statewide, or between states? ● What resources are available to support education, quality improvement, and research? 	<p>services, including referrals to services coordinated with other relevant entities prior to birth (e.g., hospitals, substance abuse treatment providers, etc.).</p> <ul style="list-style-type: none"> ● Providers can universally screen pregnant women for substance use and make referrals to treatment when appropriate. Provider groups and hospitals can collaborate to strengthen clinical standards for identification and management with women with substance exposed pregnancies or NAS-affected infants.
<p>Consider tertiary prevention efforts.</p> <ul style="list-style-type: none"> ● What support services exist for new mothers with a history of substance misuse or addiction? ● What appropriate aftercare/recovery services are needed to sustain parental recovery and child safety and well-being? 	<p>Section 4: Tertiary Prevention—Ensuring Positive Long-term Health Outcomes for Children with In-utero Opioid Exposure and Their Families</p> <p>Stakeholder Discussion Questions: Long-term follow-up and support for women and children affected by in-utero opioid exposure will ideally involve a coordinated, multidisciplinary, and family-centered approach.</p> <ul style="list-style-type: none"> ● What would wrap-around recovery services and relapse prevention ideally look like? ● How does our state support the recovery of parents and children through the work of: <ul style="list-style-type: none"> ○ Healthcare providers. ○ Mental health and behavioral health providers. ○ Family and reproductive planning services. ○ Child welfare services. ○ Child care, employment, and educational services. ○ Criminal justice reform. ● Are there some services that are not available in our communities? ● Are services accessible and appropriate? Are there opportunities for peer support and group care? ● Are services available for at least the first 18 months of a child’s life?

	<p>Example actions:</p> <ul style="list-style-type: none"> • State health agencies can develop better measures to ensure follow-up with opioid-dependent women and receipt of comprehensive services. • Providers and hospitals can make referrals for developmental or child welfare services. • Provider groups and hospitals can collaborate to strengthen clinical standards for follow-up with women with substance exposed pregnancies, NAS-affected infants, and their families. • Medicaid agencies and private insurers can provide funding for developmental services. • Child welfare services and law enforcement personnel can ensure a home environment safe from abuse and neglect by assessing safety and developing a plan of safe care. • State health and education departments can work together to provide appropriate education, screening, and support as children with in-utero substance exposure approach adolescence to prevent adoption of risk behaviors that may lead to substance misuse and addiction.
--	--

Appendix C: Ohio Participants in the Case Study and Acknowledgements

ASTHO would like to thank the following partners from Ohio who gave their time and input on the NAS framework:

- Mary Applegate, Medical Director, Ohio Department of Medicaid
- Moira Crowley, Neonatologist at Rainbow Babies and Children's Hospital, Lead Physician for the NAS Project in the Ohio Perinatal Quality Collaborative
- Mary DiOrio, Medical Director, Ohio Department of Health (ODH)
- Diane Gogan-Turner, Maternal Child and Family Health, ODH
- Karen Kimbrough, Maternal Wellness Lead, Women's Prevention Program Lead, Ohio Department of Mental Health and Addiction Services (MHAS)
- Grace Kolliesauh, Chief, Bureau of Children and Families, MHAS
- Richard Massatti, MOMS (Maternal Opiate Medical Support) Project, MHAS
- Sandy Oxley, Maternal Child and Family Health, ODH

Acknowledgements

This brief was made possible through funding from NICHQ (National Institute for Children's Health Quality). ASTHO is grateful for their support. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Institute for Children's Health Quality.

This project is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant #UF3MC26524 providing support for the Collaborative Improvement and Innovation Network (CoIIN) to Reduce Infant Mortality for \$2,992,290 (for this year 09/30/2016-09/29/2017). This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government. ASTHO is grateful for their support.