

## RESEARCH BRIEF #93

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# What is the Effect of Opioid Use During Pregnancy on Infant Health and Wellbeing at Birth?

Jessica Pac, Christine Durrance, Lawrence Berger, and Deborah Ehrenthal

### KEY FINDINGS

- Nearly 1 in 6 infants with Medicaid-funded births in Wisconsin are exposed to opioids during pregnancy.
- One month of opioid exposure during pregnancy is associated with an 86 percent increase in Neonatal Abstinence Syndrome (NAS) at birth.
- Infants exposed to Medication Assisted Treatment (MAT) or illicit opioids (heroin, fentanyl) during gestation also have above average risk of being born preterm, having low birthweight, and being small for gestational age.
- The effects we observed, while important, are considerably smaller than in previous studies that did not account for co-occurring factors, such as maternal nutrition and stress.
- Our findings highlight the importance of increasing access to treatment for pregnant women with opioid use disorders rather than relying on punitive policies that treat prenatal substance exposure as child maltreatment.

The opioid epidemic has severe consequences for pregnant women and their infants. Opioid use during pregnancy increases the risk of numerous poor outcomes at birth, including Neonatal Abstinence Syndrome (NAS), preterm birth, and low birth weight. Opioid use during pregnancy can also lead to child protective services reports and foster care entry.

Previous studies have found large effects of opioid use during pregnancy on these outcomes, but those studies have not considered the potential roles of co-occurring factors, such as maternal nutrition and stress, which may be driving the relationship between maternal opioid use and poor birth outcomes.<sup>1-4</sup> To avoid repeating mistakes made during the crack cocaine epidemic in the 1990s, when scores of children were removed from their households due to exaggerated reports of the effects of drug use on birth outcomes, it is important to accurately estimate the relationship between opioid use and infant outcomes.

This brief summarizes the findings from our [peer-reviewed publication](#) that evaluated the effects of exposure to prescription and illicit opioids during pregnancy on infant health and wellbeing at birth. We used linked administrative data from Wisconsin from 2010 to 2019 to examine standard measures of infant health at birth, such as gestational age and birthweight, NAS diagnosis, and admission to the Neonatal Intensive Care Unit (NICU). We also examined reports to child protective services in the first week after birth.

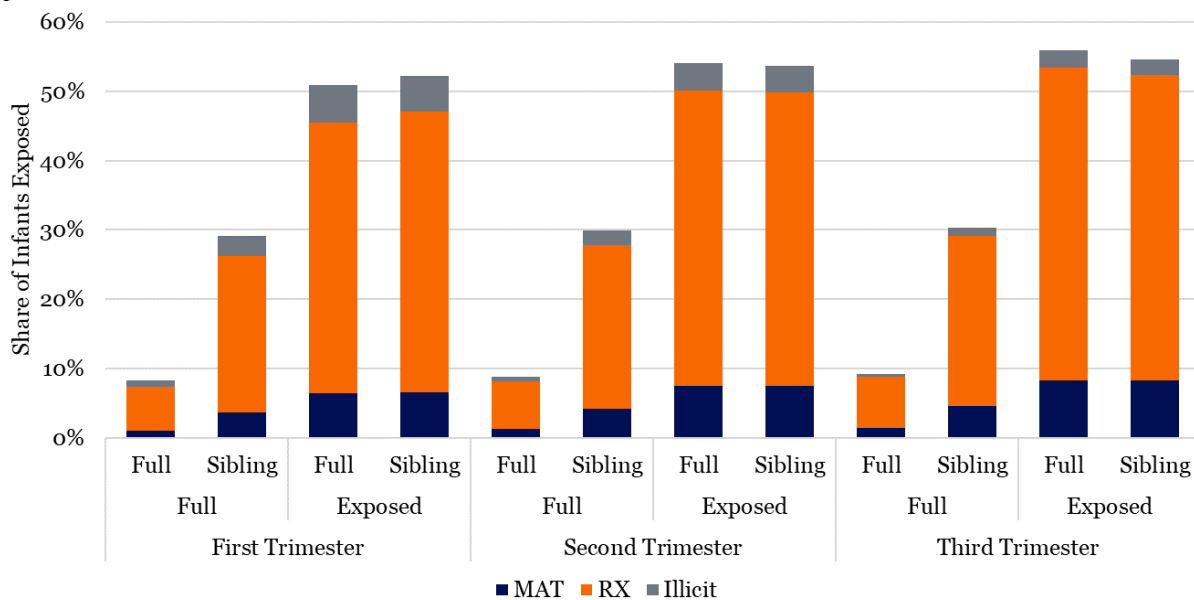
We find that exposure to both prescription and illicit opioids increases risk of NAS, due mostly to exposure to Medication Assisted Treatment (MAT) and illicit opioids (heroin, fentanyl, or illicitly obtained prescription opioids) in the third trimester. We also find that opioid use during pregnancy increases the risk of NICU admission and child protective service reports. We find only small effects of opioid use during pregnancy on other measures of infant health at birth. These results suggest that the negative health impacts are considerably lower than implied by previous studies.

### What Share of Infants are Exposed to Opioids in Utero?

We find that nearly 1 in 6 infants (16.2 percent) were exposed to opioids for an average of 6 days (full sample). We also find that more than half (55.6 percent) of those born to mothers with at least two Medicaid-funded births during the analytic period (sibling sample) were exposed to opioids in utero, with an average exposure of 21 days.

Figure 1 shows rates of opioid exposure by type of opioid for both the full sample of infants and for a secondary sample of infants born to mothers who already had at least one child whose birth was also funded by Medicaid (sibling sample).

In terms of exposure type, we see that MAT and non-MAT prescription (Rx) opioids are most prevalent in both samples in all three trimesters. Among those with any exposure (the ‘exposed’ pairs of bars), exposure to MAT and Rx opioids increases over the course of pregnancy, whereas illicit use is highest in the first trimester. This finding potentially suggests that women are referred to substance use treatment during pregnancy, transitioning from illicit opioid use to MAT.



**Figure 1. Opioid Exposure During Pregnancy, 2010-2019**

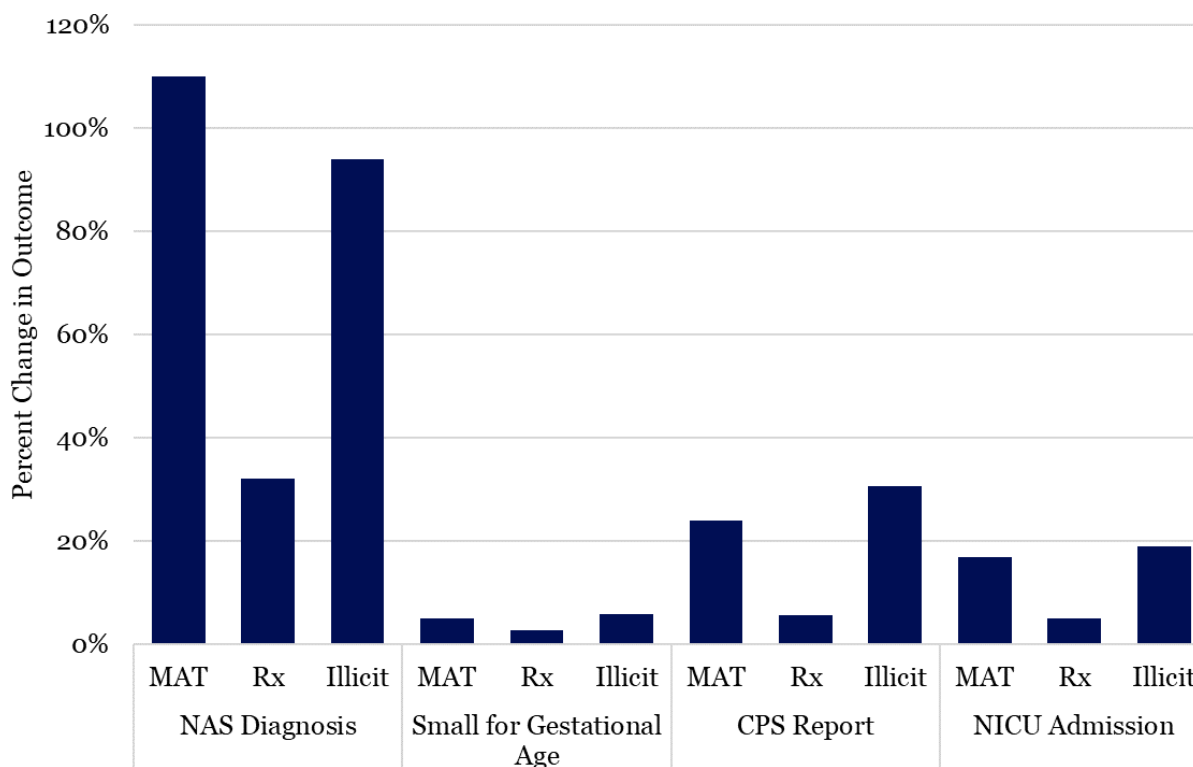
*Data Source:* Wisconsin Administrative Data Core. *Notes:* The full sample includes all Wisconsin infants with Medicaid-funded births (N=259,723) from 2010 to 2019. The sibling

sample includes infants with at least one sibling who was born in the same period and whose birth was covered by Medicaid. Exposed=mother used any type of opioid during pregnancy. MAT=Medicaid-assisted treatment, Rx=non-MAT prescription opioids, Illicit=illicit opioids.

## What is the Impact of Prenatal Opioid Exposure on Infant Health?

We are interested in whether the type and timing of opioid exposure leads to diminished health and wellbeing at birth. By making comparisons between siblings, our estimates account for the other factors that may be associated with both maternal opioid use and poor birth outcomes, such as maternal nutrition, stress, and other genetic and environmental factors. This strategy results in relatively precise estimates of the impact of each of the three types of opioid exposure on infant health and wellbeing.

Figure 2 shows the percentage difference in experiencing NAS, being small for gestational age, being reported to child protective services within 7 days of birth, and being admitted to the NICU for infants exposed to opioids during pregnancy compared to those with no prenatal opioid exposure. We find that all three types of exposure (MAT, non-MAT Rx, and illicit) are strongly associated with NAS, with MAT and illicit exposure having much larger impacts than exposure to non-MAT Rx opioids. Across all outcomes, non-MAT Rx exposure had either a small or statistically nonsignificant effect. In addition, analyses of trimester of exposure ([results shown in paper](#)) revealed that third-trimester exposure to MAT and illicit opioids is most important, with effects that are nearly double the size of those for exposure in the first trimester.



**Figure 2. The Impact of Opioid Exposure During Pregnancy on Infant Health and Wellbeing, 2010-2019**

*Data Source:* Wisconsin Administrative Data Core. *Notes:* Figure shows estimates from models comparing the outcomes across siblings by the fraction of the pregnancy with exposure to MAT, non-MAT Rx) opioids, or illicit opioids (N=39,854). (Scaled) coefficient estimates are interpreted as a percent change. See caption to Figure 1 for key definitions.

## Policy Interventions Should Focus on Increasing Access to Treatment Before or Early in Pregnancy

Our results suggest that the effects of opioid exposure on infant health and wellbeing differ by the timing and duration of exposure, as well as opioid type. Infants experience larger adverse effects from illicit opioids and MAT, especially when exposed during the third trimester. However, it is important to consider that, while MAT exposure increases the risk of NAS, evidence-based MAT treatment improves outcomes for mothers and infants because it reduces the risk of maternal opioid withdrawal and the risk of the mother cycling on and off opioids.<sup>5</sup> Moreover, though the effects we detect from exposure to non-MAT prescription opioids are relatively small, efforts to curb non-MAT opioid prescriptions should be met with other supportive interventions for mothers experiencing chronic pain.

Our findings also highlight the importance of increasing access to treatment for pregnant women with opioid use disorder rather than relying on punitive policies that treat prenatal substance exposure as child maltreatment. Failure to update treatment-detering policies could cause history to repeat itself and lead to unnecessary removal of children from their homes, with potential long-term consequences for both mothers and children.

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### Data and Methods

Our analyses use data from a restricted, linked administrative data system, the BD4LK sample of the Wisconsin Administrative Data Core that longitudinally captures detailed health, child protective services (CPS) involvement, employment, earnings, and benefit enrollment records for 259,723 Medicaid-covered births between 2010 and 2019. Using Medicaid claims linked to birth records, we measured exposure to prescription opioids using the number of days for which prescriptions were filled. We estimated illicit exposure by counting the days during pregnancy that preceded an Opioid Use Disorder diagnosis or the start date of MAT treatment (without concurrent opioid prescriptions). We used these measures to create a daily calendar, beginning with the first presumed day of conception and ending with the child's exact date of birth, which allowed us to identify the fraction of each trimester and of the pregnancy that the infant was exposed to opioids. We used regression analyses to examine the effects of opioid exposure on infant birth outcomes. For full methodological details, [see the published paper](#).

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