

## **Prenatal Drug Use and the Production of Infant Health**

Nancy E. Reichman  
Robert Wood Johnson Medical School  
University of Medicine and Dentistry of New Jersey

Hope Corman  
Rider University and National Bureau of Economic Research

Kelly Noonan  
Rider University and National Bureau of Economic Research

Dhaval Dave  
Bentley College and National Bureau of Economic Research

Pregnant women can invest in the health of their unborn children through the use of prenatal inputs such as nutrition and prenatal care, and by avoiding unhealthy behaviors, such as smoking cigarettes and using drugs. Economists have been modeling the production of infant health for about 20 years (for example, see Corman, Joyce and Grossman, 1987). Most of the earlier studies focused on the effects of positive inputs into health such as early prenatal care. More recently, economists have examined the unhealthy behavior of smoking (See Almond, Chay and Lee, 2004, for an excellent recent study). Although there is considerable interest in looking at the effects of illegal drugs, this line of inquiry has been hampered by the fact that reliable and representative data on drug use, birth outcomes, and maternal characteristics are rare. One exception is a study by Kaestner, Joyce, and Wehbeh (1996) that found that illicit drug use reduces birth weight by between 5 and 10 percent.

Although medical research on this topic is extensive, most medical studies of effects of drug use on birth outcomes have relied on small, non-random samples from individual hospital sites. As a result, the findings may not be generalizable to larger populations. One exception is a

recent multi-site analysis of over 11,000 women that found that cocaine use during pregnancy was associated with a 150-gram decrease in birth weight, controlling for mother's age, race, marital status, education, Medicaid receipt, and a range of prenatal inputs (Bada et al. 2002). It is not clear, however, whether the estimated birth weight detriment is a direct result of the prenatal cocaine use or whether it is due to an unmeasured “third” factor, such as a taste for risky behavior, that is correlated with both prenatal drug use and infant health.

The purpose of our study is to examine the effect of maternal illegal drug use on one important birth outcome: birth weight. We improve on previous studies in two ways. First, we use a large multi-site data set that includes self-reports of drug use during pregnancy, medical records during pregnancy and delivery, extensive demographic information on the mother and the father, and information about the city where the mother resides. Second, we adopt a strategy to try to reduce the potential confounding effects of unobserved factors.

**Data.** We use survey data from the Fragile Families and Child Wellbeing (FFCWB) study that has been linked to information from the respondents’ medical records and city-level data on drug prices, arrest rates for drug-related offenses, availability of prenatal services, and labor market characteristics. The FFCWB study follows a cohort of new parents and their children in 20 large US cities (see Reichman et al. 2001 for a detailed description of the research design). Interviews were conducted from 1998 to 2000 with 4,898 sets of new, mostly unwed parents shortly after their children’s births. We estimate the effects of prenatal use of illicit drugs on birth weight using the cases (approximately 2100) in 12 cities in 9 states for which medical records data are available.

We use the mother’s self-reported prenatal drug use from the baseline survey, in conjunction with evidence of prenatal drug use from the mother’s and baby’s medical records. In

the survey, mothers were asked whether they had used any of the following during their pregnancy: marijuana, crack cocaine or heroin. Fewer than six percent reported that they had ever used any of these substances, and the majority of the self-reported users claimed that they had used drugs infrequently—less than once per month. A different picture emerges when looking at the medical records; 11 percent of mothers were found, based on laboratory reports or clinical assessments, to have used illegal drugs during pregnancy. We assess the extent of bias resulting from relying on self-reported drug usage among pregnant women who give birth, by comparing the effects of drug prices and enforcement on prenatal drug usage from self-reports and from medical records.

**Methodology.** We model the demand for illegal drugs during pregnancy as a function of prices of cocaine and heroin (from the System to Retrieve Information from Drug Evidence, “STRIDE”, Drug Enforcement Agency); the intensity of drug enforcement based on the number of drug-related arrests (from Uniform Crime Reporting System, Federal Bureau of Investigation); local availability of prenatal care services (obstetricians/gynecologists from the American Medical Association, abortion providers from the Alan Guttmacher Institute, and adoption agencies from the National Adoption Information Clearing House); local labor market conditions (from the Bureau of Labor Statistics) and characteristics of both the mother and father. We estimate structural production functions of birth weight as a function of prenatal drug use, other prenatal inputs, and maternal and paternal characteristics. We use both two-step and full-information maximum likelihood estimation techniques with drug prices and drug enforcement as identifiers. We estimate reduced-form production functions of birth weight as a function of drug prices, drug enforcement, availability of prenatal services, labor markets, and

parents' characteristics. State fixed effects are included to control for variations in state policies under programs such as Medicaid and TANF.

Our results provide the first estimates of the absolute and relative effects (compared to other factors) of drug prices and drug enforcement on birth weight. The estimates are based on validated drug use data, as well as modeling techniques that allow us to obtain unbiased estimates. The results yield important information about the potential of drug enforcement as a tool for improving birth outcomes.

## References

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